

THE FRAMING OF INFERTILITY IN CANADIAN PRINT NEWS

A Thesis Submitted to the College of
Graduate Studies and Research
In Partial Fulfillment of the Requirements
For the Degree of Master of Arts
In the Department of Psychology
University of Saskatchewan
Saskatoon

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ABSTRACT

Background: The theory of framing suggests that the media have the ability to influence how the public thinks about issues (Nelson, Oxley & Clawson, 1997; Chong & Druckman, 2007), by influencing what definitions, causal attributions, moral evaluations, and treatment recommendation the public considers applicable to an issue (Entman, 1993; Tewksbury & Scheufele, 2009). The theory of framing has been supported in studies of media representations of a variety of social issues. With particular relevance to this thesis, framing studies have suggested that health news often portrays the essence of health issues as highly alarming, with few efficacious treatment or coping options (Chang, 2012). The social issue this thesis focuses on specifically is infertility.

Study 1: In Study 1, a content analysis is utilized to examine how Canadian print news frames infertility. One-hundred and fifty-seven Canadian print news articles that contained the key word “infertility” in the year 2012 were analyzed. Two independent coders read the articles, and coded each article using a predetermined coding strategy (Chang, 2012) for if/how infertility was framed with respect to: prevalence; need for alarm; severity; vulnerability; need for alertness; means of coping; causes; and possible solutions. Just over one-half of the articles employed alarm frames (n=80), and the vast majority of these met the criteria for categorization as high alarm (96%). The most commonly cited cause of infertility was delayed childbearing (41% of articles) and the most frequently presented way to cope with infertility was in vitro fertilization (IVF; 46% of articles). Infertility was most often constructed as a women’s issue.

Study 2: Study 2 build on Study 1 by examining the influence that high alarm framing strategies in the presentation of infertility have on news consumer reactions to, and knowledge of, infertility issues. One hundred and thirty-nine male and female undergraduate students were

randomly assigned to read news articles focusing on infertility judged to employ either high alarm framing strategies (high alarm condition, $n=65$) or low alarm framing strategies (low alarm condition, $n=66$). Participants in each condition read the assigned news articles and subsequently completed a self-administered questionnaire. The questionnaire included measures of: fear of infertility, perceived severity of infertility, perceived vulnerability to infertility, worry about infertility, prevention efficacy, coping efficacy, and knowledge about infertility. The participants in the high alarm condition evidenced higher levels of perceived vulnerability to infertility ($p = .04$), and marginally higher levels of worry about infertility ($p = .075$) than those in the low alarm condition. In contrast, participants in the low alarm condition relayed higher levels of infertility related knowledge than those in the high alarm condition ($p = .001$).

Discussion: Canadian print news portrays infertility as a serious, a prevalent, an alarming and predominantly a women's disease, and presents IVF as the principal means of coping. This partial depiction of infertility may not be promoting informed reproductive decision-making. Print news portrayal of infertility using high alarm framing strategies may induce higher worry about infertility and heightened levels of perceived personal vulnerability to infertility, while neglecting to relay pertinent knowledge about infertility. Implications for the societal understanding of infertility and the potential repercussions for informed reproductive decision-making are discussed.

ACKNOWLEDGEMENTS

So many people contributed to my success in finishing this Master's program and thesis. First, Dr. Karen Lawson, my faculty supervisor, played a hugely important role in every aspect of the thesis, from conceptual formulation, to data collection, writing, writing, writing, editing, to prepping for the defense, Karen was an inexhaustible fount of knowledge and support. As I was once told, "she has a mind like a steel trap" and I would not prefer it any other way. She made working on the thesis, and graduate school in general, a pleasure. Thank you, Karen. Second, my advisory committee, Dr. Pamela Downe, Dr. Jorden Cummings, and Dr. Erika Dyck, were indispensable for their contributions to the conception, methodology, and editing of the thesis. They made the process a pleasure and a challenge and I thank them for that. Third, my labmates, Melanie Bayly and Linzi Williamson were constant supports, as both colleagues and friends. I want to thank them for their kindness, comradery, and pure brilliance! Finally, I want to thank my family, particularly my parents, parents-in-law, and Tyson and Wolfgang for being such grounding forces for the last two years. It is so comforting and energizing to part of such a supportive family. Thank you.

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CHAPTER 1 INTRODUCTION

In 2014 the media are a constant presence. Newspapers, television, radio, and the now pervasive presence of the Internet in our daily lives ensure that the average Canadian is faced with an onslaught of media messages throughout their day. Media have the power to shape our understanding of the world (Bryant & Oliver, 2009; Tewksbury & Scheufele, 2009). Two families of media effects, agenda-setting and framing, have come to define the primary ways the media influence the public. Agenda-setting is the theory that the media have the power to influence what issues the public considers important, and subsequently how they behave in response to those issues (Iyengar, Peters, & Kinder, 1982; McCombs & Reynolds, 2009). Agenda-setting hypotheses have been supported in studies where, for instance, news that highlights certain political issues (over others) will influence the audience to think about those issues (rather than other issues) and in turn support the political candidate who is known to most effectively deal with those issues (rather than a candidate who is known to best deal with other lesser mentioned issues) (Iyengar, et al., 1982).

In contrast, the theory of framing suggests that the media have the ability to influence *how* the public thinks about issues (Nelson, Oxley & Clawson, 1997; Chong & Druckman, 2007), by influencing what definitions, causal attributions, moral evaluations, and treatment recommendation the public considers applicable to an issue (Entman, 1993; Tewksbury & Scheufele, 2009). The theory of framing has been supported in studies of media representations of a variety of social issues: childhood obesity (Barry, Jarlenski, Grob, Schlesinger, & Gollust, 2011), intimate partner violence (Carlyle, Slater & Chakroff, 2008), Ku Klux Klan rallies (Druckman, 2001), women's rights issues (Terkildsen & Schnell, 1997), abortion (Simon & Jerit, 2007), and poverty (Iyengar, 1991), to name a few. In each of these cases, the media have been

found to shape the public's understanding one or all of the following: the essence of the issue; what caused the issue; the moral valuation of the issue; and what should be done to deal with the issue. With particular relevance to this thesis, framing studies have suggested that health news often portrays the essence of health issues as highly alarming, with few efficacious treatment or coping options (Chang, 2012).

The social issue this thesis focuses on specifically is infertility. Infertility has garnered a significant amount of attention from medical and social scientists in the past two decades, and subsequently from the media and the public. Infertility, as currently defined by the medical community is the inability to conceive after one year of regular unprotected intercourse (Zegers-Hochschild, et al., 2009). Although the definition of infertility is somewhat contested within the medical community itself (Gurunath, Pandian, Anderson, & Bhattacharya, 2011; Larson, 2005; Marchbanks, Peterson, Rubin, Wingo, & The Cancer and Steroid Human Study Group, 1989; Mascarenhas, Flaxman, Boerma, Vanderpoel, & Stevens, 2012; Thoma, et al., 2013), social scientists argue that the experience of infertility maybe more aptly defined as a social condition as it is played out in personal, psychological and primarily in social terms (Bell, 2013; Becker & Nachtigall, 1992; Greil, McQuillan, & Slauson-Blevins, 2011; Ulrich & Weatheral, 2000). That is, the primary, and most distressing symptom of infertility itself, rather than a physical pain or defect, is the social experience of involuntary childlessness. Thus, social scientists argue that the medicalization of infertility may be inappropriate and that it may be better understood as a socially constructed category, with primarily social repercussions. This thesis is grounded in this perspective, that although the basis of infertility is sometimes a physical disorder (such as ovulation disorders, fallopian blockage or damage, or endometriosis), infertility itself can often be best understood in terms of its personal and social, as opposed to biological, repercussions.

Regardless of membership in the medical or social sciences, researchers agree that the experience of infertility can be significantly distressing (Bell, 2013; Cousineau, & Domar, 2007; Kopper, & Smith, 2001; Greil, 2002; Greil, Slauson-Blevins, & McQuillan, 2010; McQuillan, Greil, White, & Jacob, 2003; Thompson, 2002; Whiteford, & Gonzalez, 1995). While some take at face value that infertility is inherently distressing, others argue that certain social conventions or ideologies may exacerbate the distress related to infertility. Particularly, pronatalism and medicalization have been identified as potentially contributing to the exacerbation of the distress of infertility (Becker & Nachtigall, 1992; Greil, et al., 2011; Ulrich & Weatherall, 2000). The basic argument put forward by these social scientists is that the value society places on bearing children in order for women to have complete and fulfilled lives amplifies the distress of infertility. Medicalization then acts in tandem with pronatalism; the medical community reflects the values of society and as motherhood is so desired, the inability to conceive and bear children has been transformed from an unfortunate “condition” to a “disease”.

Ideology is perpetuated in society through a variety of mechanisms, one of them being the media. As mentioned above, the media have the ability to affect what the public thinks about and how they think about it. The literature review and two subsequent studies included in this thesis use framing theory as a framework to examine how the media have contributed to the social construction of infertility and how this construction affects the public’s understanding of infertility.

1.1 Objectives of Study 1

In Study 1, I conducted and report on a content analysis examining how Canadian print news frames infertility. Chang (2012) analyzed health news for alarm frames and coping frames. An alarm frame is one that highlights severity of and vulnerability to an issue as well as the need

for high alertness. An example of a high alarm headline would be “SARS epidemic” or “Widespread H1N1 risk”. Low alarm might be, “Low risk of Flu this Year”. Chang outlined coping frames as those that focus on internal and external efficacy to cope with a health issue, such as prevention, detection, and treatment. Chang found news coverage of health issues often contains high alarm frames paired with a lack of coping frames. The content analysis in this thesis examines Canadian print news focussing on infertility to determine if it conforms to the finding that high alarm and low coping frames are characteristic of all health news. Further, the content analysis examines what cause and treatment recommendations are offered in the media for infertility. Furthermore, probing the articles for a pronatalist ideology, the content analysis examines if any of the suggested ways to cope with infertility included living childfree. Finally, the content analysis also examines if media frame infertility as a female-specific issue. Together this analysis will aid in the understanding of the media’s participation in the social construction of infertility.

1.2 Objectives of Study 2

The objective of Study 2 was to understand the effects of the high versus low alarm frames consumers of infertility related news. Study 2 employs a 2 x 2 experimental design to compare the effects of high and low alarm frames. Chang (2012) suggested high alarm frames increase fear, worry, and avoidance but not greater knowledge or efficacy for health issues in general. Study 2 examines if the effects of infertility news high in alarm conform to those findings by examining if exposure to high alarm frames results in increasing perceived prevalence of infertility, severity of infertility, fear and worry about infertility, perceived efficacy and knowledge of infertility. Further, Study 2 examines if being exposed to multiple news articles on infertility employing high alarm frames compounds the framing effects.

CHAPTER 2 LITERATURE REVIEW

2.1 Media Effects

The constant presence of media in current western society is undeniable. From more traditional forms of media, such as newspapers, magazines, radio, and television, to more modern forms such as online newspapers, blogs, and Internet social media, the average Westerner is bombarded with thousands of information messages throughout their day. The media serve an integral function in society as the main means of mass communication. The media transmit important information to the public and thus carry out an important educative function for our society. They educate the public on current events in politics, health, science, technology, art, and global and local happenings. The media also serve an entertainment function and play a major role in the transmission and maintenance of global and local culture.

News media, particularly the profession of journalism, has been attributed the role of creating “the first rough draft of history” (Barth, 1943). That is, journalists are often the first recorders and transcribers of current events, with their stories often being the only publically available historical record of many events. The public rely on media as recorders and transmitters of information. Given this role, the media play an undeniably important role in shaping the public’s understanding of both current and past events. The media of past and present has unquestionably shaped our understanding of the world.

Not surprisingly, the extent of the media’s influence over the public has been an area of interest for researchers for at least a century. Lippmann (1922) first outlined the fundamental concepts of media effects. Lippmann stated that, in actuality, our behavior is a reaction to a pseudo-environment, an environment that we perceive as real, but that is constructed by our exposure to a variety of mediums of fiction. He outlined that by fictions he did not mean lies, but

reconstructions of events and objects that are necessary because of any individuals' limited capacity to experience the entire world by direct sensation. In order to learn beyond our direct experience, these media constructions are necessary. Interestingly he also alludes to the need for cognitive heuristics (mental shortcuts) in this work. He states,

For the real environment is altogether too big, too complex, and too fleeting for direct acquaintance. We are not equipped to deal with so much subtlety, so much variety, so many permutations and combinations. And although we have to act in that environment, we have to reconstruct it on a simpler model before we can manage with it. (p. 20)

In this quote Lippmann implies a theoretical basis of media effects, by suggesting that it is impossible for individual's to know the entire world through direct sensation, and also that individuals are cognitive misers whom are unable to critically reflect on every piece of information presented to them. These points together highlight the public's reliance on the media's reconstructions of events and objects to more fully understand the world in which they live. That the public depends on the media for these reconstructions and reinterpretations highlights the media's potential power to construct the public's understanding of social phenomena.

Media effects have most widely been studied in the arena of political communication. The first media effects studies were conducted in the late 1960's (McCombs & Shaw, 1972). During the 1968 presidential election McCombs and Shaw (1972) carried out a survey of undecided voters to determine what they considered to be the most important political issues at the time. Each issue was ranked in terms of percentages of voters listing it as a priority. The researchers then conducted a content analysis of news by major newspapers and television networks, counting the number of new stories devoted to each issue. The researchers found a

high correspondence between the issues that had been highlighted in the news and the issues the public considered important. That is, they found that the public's agenda largely mapped onto the media's agenda. Although it is possible that public opinion drove the media focus, the researchers posited that the opposite was most likely the case. Specifically, they argued this highlighted the agenda-setting ability of the media; that the media have the ability to influence the prominence of political issues for voters by focusing on those issues.

2.1.1 Agenda-Setting

Numerous correlational studies have supported the agenda-setting hypothesis. For instance, an historical study of civil rights issues found a very high positive (.71) correlation between the issues featured in the New York Times and the issues that were considered the most important of the eras (Winter & Eyal, 1981) and a study of crime news found that increased exposure to crime news increased individuals' perceptions of the pervasiveness of crime (although not fear of victimization; Gross & Aday, 2003). It is critical however, to consider that perhaps, the correlation between issues in the news and the public's perceptions of those issues as important may be due to the media simply reporting on important news. That is, perhaps the media and the public both focus on the same issues because they are pervasive and important in society. Unfortunately that is often not the case. For example, in the 1980's there was an increasing amount of news coverage about drugs, when there was no corresponding increase in the actual use of drugs (Reese and Danielan, 1989). In the 1990's there was an increase in the amount of news on crime when there were in fact, decreasing crime statistics (Ghanem, 1996, as cited in McCombs & Reynolds, 2009). Finally some studies have shown no correlation between news coverage of major issues and the prevalence of those issues, while demonstrating a significant correlation between prevalence of news coverage and the public's perception of the

importance of those issues (Funkhouser, 1973).

Although these findings support the notion that actual issues may not set the agenda for the public and the media, there still exists the question of which comes first, the public's assessment of issue importance (regardless of actual issue existence, as mentioned above), or the media's reporting of issues as important. Thus, from correlational studies it still is not clear if the media sets the public's agenda, or if the public sets the media's agenda. As will be discussed in depth later, the relationship is likely bidirectional as journalists and other members of the media both influence and are influenced by society.

However, experimental studies have also supported the notion that the media sets the public's agenda. For instance, a study of public opinions of presidential candidates, (Iyengar, et al., 1982) found that news that highlights certain political issues will influence the reader think about those issues and in turn support the political candidate that is known to most effectively deal with those issues. For example, highlighting civil rights issues or unemployment may lead to the endorsement of one candidate, as those areas of policy are that particular candidate's strengths, while focusing on arms control or defense preparedness may lead to the endorsement of another candidate because those policy areas are known as their strengths. This supports the agenda-setting hypothesis in that the news did not endorse one candidate, but it highlighted the saliency of issues, which led to the readers' internalization of those issues being important, and in turn led them to endorse certain political candidates over others.

2.1.2 Framing

More recently than agenda-setting, framing has been introduced as a potentially powerful media activity. The most often cited definition of framing outlines that "to frame is to select some aspects of a perceived reality and make them more salient in a communicating text in such

a way as to promote a particular definition, causal interpretation, moral evaluation and/or treatment recommendation” (Entman 1993, p. 52). Thus framing occurs when journalists choose certain words to describe events and objects. Those words then create images and ideas of events and objects that influence how audiences will interpret and understand them.

How the media frame issues has been studied in a variety of contexts. Content analyses of the framing of childhood obesity reveal the issue is most often framed as one for which individuals rather than society is responsible (Barry, et al., 2011). Likewise, content analyses of intimate partner violence demonstrate that this violence is most often framed in episodic (individualized accounts) terms and very rarely in thematic (focusing on societies role) terms (Carlyle, et al., 2008). Finally health news has been analyzed and determined to most often contain alarm frames and very rarely coping frames (Chang, 2012).

The current concept of framing has been informed by distinct theoretical perspectives . For instance, Heider’s (1958) work on attribution theory suggested that humans reduce their social perceptions to causal attributions. That is, that we generally attempt to interpret simultaneously presented but non-related events and happenings as meaningful stories with causal origins. For instance when presented with moving inanimate shapes, participants attribute these shapes with human motivations and create an accompanying story related to their movements (Heider & Simel, 1944). This theory highlights that individuals have a desire to tie together otherwise haphazard or random phenomena in order to gain a greater understanding of the world around them. Individuals may be motivated to do so because patterns are easier to interpret, anticipate, and cope with than are otherwise random occurrences.

Goffman’s (1974) book *Frame Analysis: An Essay on the Organization of Experience* also had a major influence on the current conception of media framing. Goffman’s position on

framing was related to the individuals' organization of their experience. That is, individuals frame their experiences; they organize what may otherwise be meaningless random occurrences within a frame to give meaning to their life history. In Goffman's formulation, "frames" provide structure to events and objects. "Primary frameworks", the most basic units of frames, are socially shared and socially constructed category systems used for classifying information. For instance, a "fight" would constitute a primary framework, while the specific frame might be a "play fight" or a "boxing match". Basically, Goffman suggested that any individual observing an event or activity has to find an answer to the question, "what is going on here"? (Smith, 2011). They need to determine the essence of an event, if an event is a game or a play or a rehearsal or a test. Goffman suggests that individuals use frames like metaphorical picture frames, to hold a strip of activity together into a meaningful whole. He suggested this is how individuals make sense of experience.

Goffman's concept of frames is not unlike Bartlett's (1932) concept of schemas, mental structures that organize our knowledge about the social world (Aronson, Wilson, Fehr, & Akert, 2013). Schemas are mental shortcuts, which ease individuals' understandings of the world by providing them a script for how commonly faced experiences occur. From our predetermined schemas we know that a night out for dinner usually proceeds in a certain way, as does a day at school, a birth, a marriage, or other social events. Schemas allow for ease of processing information, because with our established schemas we can make assumptions about how commonly experienced events will proceed. Schemas allow us to "fill in the blanks" (Aronson et al., 2013) without a lot of cognitive processing. However, when participants fill in the blanks with schema-consistent information there is an critical thinking-speed tradeoff. That is, schemas save time at the sacrifice of critical thinking. When we quickly fill in the blanks without

critically thinking about an issue, we may make incorrect, inappropriate, or overextended assumptions about the issue, which have serious social consequences. For instance, studies on schemas about social groups (stereotypes) have demonstrated that participants will disproportionately assume that an ambiguous object in a Black man's hand is a handgun while assuming that the same object in a White man's hand is a cell phone (Correll, Park, Judd, & Wittenbrink, 2002).

The most proximal psychological foundation of framing was established by Kahnman and Tversky (1984). Their theory suggests that any message can be comprehended differently depending on the interpretive schema used to understand the message. They suggest that rather than interpreting facts and probabilities, individuals rely on cognitive heuristics (mental shortcuts) to process information. Therefore, depending on the information surrounding a given message, the exact same message can be understood differently, and decisions can be made, not on differing factual details, but on the divergent frame. For instance, decisions have been found to differ based on whether information is framed in terms of losses or gains. Given a pandemic situation in which individuals are asked to choose a course of action, approximately three quarters of respondents will choose a course of action when it is certain that 200 of 600 people will be saved. Given the exact same course of action, but framed in terms of loss, with 400 of 600 people dying, only approximately one-quarter of respondents will select this option. This highlights the behavioural ramifications of framing; how information is framed has repercussions for human behavior.

The cognitive foundations of framing are somewhat contested (Tewksbury and Scheufele, 2009). Although it is generally accepted that accessibility underlies agenda-setting effects, the extent to which accessibility, applicability, or both underlie framing is debated.

Accessibility refers to relative ease with which one can bring thoughts to mind (Nelson, Clawson, & Oxley, 1997), how available those thoughts are, while applicability refers to the extent to which certain considerations are more applicable to an issue. In terms of agenda-setting, when considering which issues are most important, an individual may rely on the ease to which issues come to mind, accessibility, in order to determine importance. The more prominent an issue has been in the news, the more accessible the issue is in their mind, and the more important they may judge that issue. For instance, an abundance of news about an economic recession during federal election campaigning may make economic issues more accessible in the mind of the public. Since economic issues are easily brought to mind (accessible), the public considers them more important than other issues, and perhaps votes with these issues in mind.

Some argue (Price & Tewksbury, 1997; Nelson, Clawson, Oxley, 1997) that the key distinction between framing and agenda setting is the cognitive mechanism that underlies them. They argue that the distinction is that framing relies on the cognitive principle of applicability. Applicability refers to the degree to which certain considerations are more relevant to an issue. When certain considerations are more relevant, they are weighted more strongly than others that may seem less relevant to the issue. Fundamentally, certain frames may make certain issue definitions, causal interpretation, moral evaluation and/or treatments more applicable to an issue than other frames might. For instance, in one study, participants were exposed to news articles about abortion procedures (Simon & Jerit, 2007). The articles were identical except for one feature, one article used the term fetus while the other used the term baby when referring to the object of the procedure. This systematically altered the meaning of abortion; in the former case it was less personal, in the latter case, it was a procedure that involved a person, a baby. Support for regulating the procedure differed in that participants exposed to the term “baby” endorsed

more regulation of the procedure than did those exposed to the term “fetus”. The framing altered the definition of the issue and thus the applicability of certain moral or medical judgements. The key distinction is that agenda-setting highlights an issue’s importance, while framing highlights the linkages between the issue and certain concepts and weakens the connections to others. Agenda-setting may influence what the public thinks about via accessibility, while framing may influence how the public thinks about those issues, via applicability.

The previous example also illustrates the distinction between framing effects and information effects. Framing effects as outlined above involve the consequences of *how* information is presented, not effects of the information itself (Nelson, Clawson, & Oxley, 1997). Information itself should, and often does have an effect on audiences. Information effects occur when, for instance, a news consumer, otherwise unaware that unsafe abortions often cause injury and sometimes death in jurisdictions where abortion is not legal, views news explaining such, and subsequently decides they support the procedure being legalized, because they learned information about the procedure that was previously unknown to them. In this instance, the news consumer learned a new piece of information and formed a decision based on that information. In contrast, a framing effect occurs when *information is held constant*, but associations with other ideas such as meanings (e.g. baby versus fetus), causal interpretations, and treatments are altered (Tewkbury & Scheufele, 2009). In other words, the detail regarding the issue does not cause a framing effect, the linkages with other concepts do.

Likewise, framing effects are unique from persuasion effects (Nelson, Oxley & Clawson, 1997). While persuasion typically involves changes in attitudes towards an object or event, framing involves changing the way the audience interprets an object or event (Nelson, Oxley & Clawson, 1997; Tewkbury & Scheufele, 2009). Persuasion will influence an individual by

encouraging a positive or negative response to the attitude object. Framing will affect an individual by changing how they think about a framed object, including their understanding of precisely what the object is, their moral evaluation of the object, what caused it, and how it should be dealt with. Another key distinction is that persuasion is always an active exploit, while framing can be purposeful, but often also occurs unconsciously as communicators themselves have internalized societies dominant views of objects, events, or issues and in turn may unknowingly perpetuate them.

Given the implications of framing for contributing to how the public views reality, it is important to consider where frames come from. First, and most obviously, journalists play a chief role in the crafting and disseminating frames. However, it is important to remember that journalists do not produce the news in a vacuum and they are themselves affected by a wide variety of social influences. Three main areas of influence over journalists' choice of frames have been identified: journalistic norms, political and corporate actors, and cultural contexts (Tewksbury & Scheufele, 2009).

First, in regards to journalistic norms, journalists rely on frames to make nonrecognizable happenings into meaningful events or stories. If the frame is "the central, organizing idea or storyline that provides meaning to an unfolding strip of events" (Gamson & Modigliani, 1987, p. 143), the frame of an issue becomes a working routine for journalists, which allows journalists to quickly classify information in order to understand how a new happening can be interpreted as another cog of the greater story on the issue (Scheufele, 1999). Second, political and corporate actors regularly attempt to frame issues certain ways in order to advance their political or economic interests. Journalists will adopt these frames in their own work depending on the extent to which they are convinced by the political or corporate actors, the degree to which they

agree ideologically with these interpretations, and if they have the cognitive resources available to critically reflect on the interpretations being presented to them. Finally, cultural contexts will affect the extent to which journalists adopt and perpetuate certain frames. Journalists exist within a culture and therefore use cultural frames that are available and recognizable to them. In fact, stronger frames are those that align the most with the culture in any given time and place (Tewksbury & Scheufele, 2009). The extent to which a frame is culturally relevant and makes sense in the current narrative of the culture is referred to as “cultural relevance” (Gamson & Modigliani, 1989) or “narrative fidelity” (Snow & Benford, 1988).

Framing theory has proven to be a robust model for understanding how the manner in which the media present news information affects the consumers of that information (Chong & Druckman, 2007; Druckman, 2001, Tewksbury & Scheufele, 2009). Most framing studies examine changes in cognition or affect at the individual level after being exposed to a variety of frames. For instance, participants exposed to news stories on Ku Klux Klan rallies framed as a free speech issue were significantly more tolerant of the rallies than were those exposed to the same stories with a public safety frame (Druckman, 2001). Women’s rights issues framed in news stories as issues of political equality garnered more support from male readers than those framed as issues of economic equality (Terkildsen & Schnell, 1997). Frames can also effect how participants attribute responsibility for an issue. Frames that focus on individual cases influence audiences to make personal attributions for social problems (to blame poverty on a personal attributes of the poor, for example) while frames that focus on broader social, political, and economic forces, influence audiences to make social attributions (to blame poverty on economic problems or political decisions, for example; Iyengar, 1991).

Some moderators of framing effects have been identified. Firstly, frames that contain all

four of Entman's (1993) associative connections of framing (the problem definition, the causal interpretation, the moral evaluation, and the treatment recommendation) are considered the most powerful (Tewksbury & Scheufele, 2009). However, most frames focus primarily on the issue definition and treatment recommendation. In other words, frames generally focus on the essence of what an issue *is*, and then also, what course of action should be taken to effectively deal with the issue. Lesser attention is generally provided to determining the cause of an issue (although that can be entwined with the definition), or its moral evaluation. Frames can have a stronger effect when the audience has little previous exposure to an issue. In these cases, the audience does not have a previously established cultural schema about the issue, and as such is more impressionable on the topic. In contrast, frames that tap into culturally common or previously existing values are also likely to produce stronger framing effects. For instance, frames that focus on individualism, meritocracy, and personal responsibility may have a particularly strong hold on western audiences.

Chang (2012) analyzed health news for alarm frames and coping frames. Theoretical frameworks of health attitudes and behaviours [e.g., health belief model (Rosenstock, 1966); extended parallel process model (Witte, 1994); protection motivation theory (Rogers, 1975)] posit that messages that effectively relay the severity of, and vulnerability to, a specific health issue, as well as effective ways to cope are most likely to contribute to attitude and/or behavior change in relation to the health issue. Grounded in these theoretical principles, Chang (2012) analyzed health news for alarm frames (which highlight severity, vulnerability, and a need for high alertness regarding an issue) and coping frames (which focus on internal and external coping efficacy such as prevention, detection, and treatment). An example of a high alarm headline would be "SARS epidemic" or "Widespread H1N1 risk". Low alarm might be, "Low

risk of Flu this Year”. Chang found news coverage of health issues often contains high alarm frames paired with a lack of coping frames. Exposure to news coverage high in alarm and low in coping frames was found to elicit fear, worry, and avoidance, but not an increase in issue knowledge nor prevention or treatment efficacy (Chang, 2012). This type of news coverage has been associated with fatalistic beliefs about health issues, such as cancer prevention (Niederdeppe, Franklin Fowler, Goldstein, & Pribble, 2010). The remainder of the thesis will focus on the framing of a particular health issue, prominent in the news today- infertility.

2.2 Infertility

Infertility, as both a medical and social issue, has been gaining attention from media, scholars, and government from around the globe for more than a decade (Bushnik, Cook, Yuzpe, Tough, & Collins, 2012; van Balen & Inhorn 2002). As stated in the introduction, the medical community typically defines infertility as the inability to conceive after one year of regular, unprotected intercourse (Bell, 2013; Daniluk, 2001; Greil, 2002, Van Horn & Reed, 2001). The fluctuating prevalence of infertility is of concern to the medical research community as it has repercussions for health beyond time to pregnancy alone. Longer time to pregnancy can increase the risk of adverse pregnancy outcomes and gravid diseases, which in turn may influence the development of later-onset adult diseases (Thoma et al., 2013). For governments, the prevalence of infertility has repercussions for demographics and thus social and economic consequences. According to the most recent statistics, between 11.5 and 15% of Canadian couples experience infertility (Bushnik et al., 2012). In the United States, the current prevalence of infertility ranges from 7 to 15.5% of women (Thoma et al., 2013). Worldwide, approximately 1.9% of women experience primary infertility (the inability to conceive a first child), while 10.5% of women experience secondary infertility (the inability to conceive when one has previously conceived)

(Mascarenhas, Flaxman, Boerma, Vanderpoel, & Stevens, 2012).

The medical community defines infertility in a variety of ways. How infertility is defined has implications for how its prevalence is estimated, and thus what prevalence statistics are reported (Gurunath, et al., 2011; Larson, 2005; Marchbanks, et al., 1989; Mascarenhas et al. 2012; Thoma, et al., 2013). The World Health Organization's (WHO) clinical definition is "a disease of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse" (Zegers-Hochschild, et al., 2009). Alternatively, WHO's epidemiologic definition is "women of reproductive age at risk of becoming pregnant who report unsuccessfully trying for a pregnancy for more than two years" (WHO, 2006). The most recent worldwide prevalence statistics have been calculated using a definition of infertility as "the absence of a live birth for women who desire a child and have been in a union for at least five years, during which they have not used any contraceptives" (Mascarenhas, et al., 2012, p. e1001356). This definition, using a five year exposure period, was cited as the most appropriate for estimating prevalence because this longer time period is needed to accommodate the time it takes to become pregnant and give birth, and helps prevent unreported temporary separations, periods of postpartum sexual abstinence, or lactational amenorrhea from disproportionately affecting the infertility measure.

The definition used to define infertility can affect the reported prevalence rates. For instance, in recent U.S. studies, one definition (the current duration definition, which includes women who are sexually active, not using contraception, and trying to become pregnant) estimated the prevalence of infertility to be 15.5% of women, while another (the constructed definition, which includes women who have been cohabitating with their partner for at least a year, sexually active each month in the past 12 months, and not used contraceptives in the past

12 months) estimated the prevalence to be a more modest 7.0% (Thoma, et al. 2013). The authors concluded that a consistent definition is necessary in order to accurately monitor the fluctuating prevalence of infertility. Moreover, although some recent studies have suggested that the population prevalence of infertility is increasing (Bushnik et al, 2012; Petraglia, Gamal, Serour, & Chapron 2013), other studies suggest that infertility rates are stagnating or perhaps declining (Boivin, Bunting, Collins, & Nygren, 2007; Mascarenhas, et al., 2012; Rostad, Schmidt, Sundby, & Schei, 2013; Stephen, & Chandra, 2006). This debate highlights the importance of using a common definition and methodology in measuring the prevalence of infertility, but it also highlights that the prevalence of infertility is a contentious and high stakes issue in the medical community.

Regardless of definition and prevalence, there is substantial agreement that those diagnosed with infertility often experience significant social, emotional, and psychological consequences (Bell, 2013; Cousineau, & Domar, 2007; Kopper, & Smith, 2001; Greil, 2002; McQuillan, et al., 2003; Thompson, 2002; Whiteford, & Gonzalez, 1995). Although the etiology of infertility is attributable approximately equally to male-factor and female-factor infertility (Gupta, Mires, & Khan, 2011), women disproportionately suffer the social emotional and psychological consequences (Bell, 2013; Greil, 2002; McQuillan, et al., 2003; Thompson, 2002). Whether the cause is attributable to male or female factors, the evidence of infertility plays out on women's bodies; it is the women who "fails" to become pregnant (Greil, 2002). In fact, the definition of infertility (see above) often specifically mentions women's "failure" to become pregnant. Thus, women often experience and accept the blame for infertility, even when the etiology of their infertility is male-factor or unknown. Women experience anxiety, frustration, grief, fear, marital duress, community ostracism, and undergo complicated and invasive medical

treatments all as the result of their experienced or apparent infertility (van Balen & Inhorn, 2002).

Some authors argue that the social and emotional repercussions differ for women in developed and developing countries and for women of different races and classes. For instance, in developed countries, bearing children is viewed as more of a personal choice than it is in developing countries, and this may lead women experiencing infertility to experience different kinds of stigma and emotional consequences (van Balen & Inhorn, 2002). Infertile women in developed countries may experience silent stigma, as they are assumed to not have children out of personal choice, while infertile women in developing countries are easily recognized as infertile, because it is assumed that all women who can produce children will. Likewise, women of low socio-economic status in developed countries may disproportionately experience the stigma of infertility as they are disproportionately assumed to be fertile; the public often characterizes them as hyper-sexualized and sexually irresponsible, and thus as a group who should not have any problems conceiving (Bell, 2009; Greil, McQuillan, Slauson-Blevins, 2011).

Despite the equal or higher rates of infertility in the developing world, White, middle-class, heterosexual women who have delayed having children in favor of furthering their career are viewed as the typical infertile woman. The medical recommendations for these women versus poor women, women of colour, women in developing nations, and women who embrace an alternative sexual orientation differ. White middle or upper-class women are encouraged and expected to seek treatment for their infertility, and have a child at all costs. In fact many women feel they have no choice but to seek treatment due to the stigma associated with childlessness (Ulrich & Weatherall, 2000). Poor women, women of colour, and women with alternative sexual orientations are not encouraged to seek treatment. In fact, as these women are often portrayed as

hypersexualized, their primary reproductive concern, as viewed by the public, should be increased contraception use (Bell, 2009; Cussins, 1998).

Numerous elements of society have been identified as factors that may contribute to women's exacerbated distress regarding infertility. Two of those factors include the social construction of infertility as a medicalized, women's disease, and the widespread pronatalism in both developed and developing countries. Medicalization refers to the process by which a phenomenon is transformed from being understood as a human experience to being understood as a medical problem (Becker & Nachtigall, 1992). In this process non-predominant ways of being, interpreted as deviant due to their lack of conformity to the usual human experience, are relegated to areas of medicine with hope that science can find a cure for that deviancy. Medicalization has been studied by historians, anthropologists, sociologists, physicians, and psychologists in relation to many conditions that appear to diverge from the norm such as madness, alcoholism, opiate addiction, hyperactivity, learning disabilities, obesity, homosexuality, and infertility (Conrad, 1992). At different times in history or in different places in the world these variations of the typical human experience have been understood as medical diseases, disorders, or disabilities, while in other places or other times, they have been understood simply as other ways of being, no more or less inherently pathological than more common ways of being.

Many argue infertility has been medicalized (Becker & Nachtigall, 1992; Conrad, 1992; Geil 2002; Greil, McQuillan & Slauson-Blevins, 2011). As mentioned above, as of 2009 infertility has been defined as “a *disease* of the reproductive system defined by the failure to achieve a clinical pregnancy after 12 months or more of regular unprotected sexual intercourse.” (Zegers-Hochschild, et al., 2009, p. 1522, emphasis added) by WHO. When infertility (or other

human experience) is medicalized, pathology and distress seem characteristic of the experience when none necessarily exist (Becker & Nachtigal, 1992). Thus, the medicalized understanding of infertility is that it is inherently pathological, that it inherently causes distress, and that it is obviously undesired. Granted, as listed above, there is plenty of evidence to suggest that infertility can and does create a great amount of distress to those that experience it. However, some researchers question whether the distress suffered by those experiencing infertility is entirely inherent in the condition itself, or if it is perhaps partly due to the social construction of the condition as pathological.

Indeed, van Balen and Inhorn, (2002) point out that, to fully understand the consequences of infertility, pronatalism, (“child desire- or the perceived importance of having children”, p. 8) must be investigated. For instance, regardless of how medical practitioners or epidemiologists may define infertility, couples or individuals do not identify as infertile or seek treatment for infertility unless they want to have children. For those who have no desire for children, “infertility” is not a problem, and in fact may be seen as a convenience. As will be discussed further below, not all individuals who meet the technical criteria for infertility self-identify as infertile, and of those who do, not all seek treatment. Thus, unlike other diseases, where symptoms necessitate a cure or at least control, infertility only necessitates addressing if the individual or couple desires children.

It is important to recognize that there may be biologically-based medical conditions (e.g. polycystic ovary syndrome, endometriosis, or damaged or collapsed fallopian tubes) that give rise to infertility, but these are the medical conditions that may warrant medical treatment, not infertility per se. Infertility itself is not the underlying disease. Furthermore, many “conditions” have a biological basis (e.g. red hair, small breasts, homosexuality) but that does not mean they

are necessarily diseases or that they require treatment or intervention; they are simply alternate or less common ways of being. Ultimately, infertility itself is not characterized or diagnosed by the presence of clinical symptoms, but by the absence of a preferred state (Greil, McQuillan, Slauson-Blevins, 2011). Thus, pronatalism, “child-desire”, necessarily interacts with the medicalization of infertility.

Pronatalism is an ideology that highly values procreation and essentially mandates parenting. In a pronatalist society women’s social value is considered inextricably connected to mothering (Parry, 2005), and motherhood is synonymous with femininity and the female identity. In a pronatalist society women are defined by their relationship with motherhood, whether or not they actually have or truly want children (Morell, 2000). Having children is seen as a right of passage to adulthood (Greil, et al., 2011), and as necessary for a complete life for women (Morell, 2000). Morell states:

To say it simply, women who purposefully do not have children are not taken on their own terms, but are measured by the idealized standard of motherhood. This creates confusion for women who are not mothers and reduces the reproductive options of all women, because a childless life is not conceptualized as a viable or appealing choice. (p. 313)

Pronatalism can contribute to substantial social consequences for childless women. Voluntarily childless women are stereotypically portrayed as selfish, aberrant, immature or unfeminine, while involuntarily childless women are cast as desperate, unfulfilled, and to be pitied (Letherby, 2002), as patients, as emotionally distressed, as socially handicapped, as cultural dupes, or as heroic sufferers (Sandelowski & de Lacey, 2002). Since their childless state is not their choice, they may be viewed as victims. Childlessness, whether voluntary or

involuntary, is often stigmatized by society.

Some argue that pronatalism is endemic in western society (Ulrich & Weatherall, 2000) and pronatalist policies in Canada such as child allowances, year-long maternity/paternity leave, priority parking for parents, and the now publically-funded IVF in Quebec may lend support this argument. Feminists, as a group, have a variety of divergent viewpoints on the topic of pronatalist policies. As mentioned above, women disproportionately bear the burden of involuntary childlessness, as it is ultimately perceived as the woman in a couple who “fails” to become pregnant (Greil, 2002). Thus, feminists have recognized this burden and, as such, have taken up infertility and involuntary childlessness as a serious feminist issue (Thompson, 2002). Conversely, feminists have also long recognized the connection between women’s struggle for equality and the disparate amount of childcare they are expected to perform; they recognize that the emphasis on motherhood for women’s identity has contributed to their unequal socio-economic position (Thompson, 2002). Thus some policies that are viewed by some as pro-woman (e.g. publically funded IVF) can simultaneously be viewed as antifeminist because they perpetuate the importance on motherhood for women’s identity. Some feminists see infertility as a serious women’s issue, while others argue that emphasizing infertility as a women’s issue reinforces traditional gender roles and continues to emphasize the taken for granted assumption that women should or must be mothers (Thompson, 2002).

A variety of social scientists argue that to better understand health and illness, and their consequences, it is useful to think of them not as objective measureable states, but as “socially constructed categories negotiated by professionals, sufferers, and others within a socio-cultural context.” (Greil, et al., 2011, p. 736). That is, what is abnormal, what caused that abnormality, and what course of action to take to deal with the abnormality all become obvious within a

sociocultural context, not because of the inherent nature of states as good or bad, but because of the way those states are framed within our society. As Greil and colleagues (2011) state, “infertility is best understood as a socially constructed process whereby individuals come to regard their inability to have children as a problem, to define the nature of that problem, and to construct the appropriate course of action” (p. 737). Note the similarity of this conception to that of framing mention earlier: “To frame is to select some aspects of a perceived reality and make them more salient in a communicating text in such a way as to *promote a particular definition, causal interpretation, moral evaluation and/or treatment recommendation*” (Entman 1993, p. 52). Indeed, certain aspects of reality have been focussed on in order to promote a particular definition of, causal interpretation for, moral evaluation of, and treatment recommendation for infertility.

One example of how certain aspects of reality have been focussed on in the social construction of infertility lies in the studies of psychological, emotional, and social consequences of infertility. As mentioned above, these studies consistently find that women who experience infertility experience significant psychological distress, anxiety, and social stigma (Bell, 2013; Cousineau, & Domar, 2007; Kopper, & Smith, 2001; Greil, 2002; McQuillan, et al., 2003; Thompson, 2002; Whiteford, & Gonzalez, 1995). However, an important limitation of these studies is that they focus on a very particular subpopulation of those who experience infertility; they focus on helpseekers (Greil, & McQuillan, 2010). That is, the participants in these studies are women who self-identify as infertile, seek intervention, and participate in fertility treatment. Participants for these studies are recruited from infertility clinics. Therefore they do not include a representative sample of women who would be considered infertile by the medical definition, they include a subset of infertile women with “a strong desire to become pregnant and the social

and material resources that will allow them to do ‘whatever it takes’ to have a child” (Greil et al, 2011, p. 739).

Helpseekers are most often white, middle-class and are comfortable with medical settings (Greil & McQuillan, 2010). “Women who do not or cannot present themselves for treatment disappear from view” (Greil & McQuillan, 2010, p.140). Women who do not present for treatment may not be able afford treatment, may not be comfortable with medical interventions, or, simply may not be distressed by their inability to conceive. Considering only approximately half of infertile women seek treatment and only about a quarter of those women receive treatment (Boivin et al., 2007), there may be a large population of women who would be considered infertile by the medical definition, but whose psychological reaction to infertility is largely unstudied and unknown. It is possible that they may not experience infertility as a wholly distressing experience. In fact, some may experience liberation from the “motherhood mandate” (Russo, 1976) of pronatalism and freedom to explore other life pursuits.

Many argue that childlessness and infertility have been falsely equated and that the term “involuntary childlessness” is more accurately descriptive than “infertility”. As mentioned above, not all those who experience infertility necessarily experience distress. They may be only temporarily distressed or they may even see their infertility as a convenience or a relief. Furthermore, not all those who do experience distress associated with childlessness are technically infertile. For instance, in some developing countries a time span as short as two to three months without becoming pregnant, the production of only female children, and the production of only few children can result in a social label of infertile (van Balen & Inhorn, 2002). Further, members of the LGBT community and individuals who are not in a sexually active heterosexual relationship may disproportionately experience the distress of childlessness.

However, none of these individuals would technically be considered infertile by the medical definition. Since not everyone who desires children but does not achieve parenthood necessarily experiences distress, and likewise not everyone who experiences distress over a childless state is technically infertile involuntary childlessness may more accurately represent the essence of the issue than is the medicalized terminology of infertility (Bell, 2013).

Medicalization of involuntary childlessness “began in earnest” (Greil & McQuillan, 2010, p. 137) with the advent of what would be the first generation of assisted reproductive technologies in the 1950’s. Without doubt, such technologies have facilitated the procreative efforts of many individuals and helped them to create a much desired family that included children. Medicalization is also sometimes thought to benefit those with infertility (or those with other medicalized conditions) by reducing the responsibility attributed to the individual for the “disease” (Becker & Nachtigall, 1992). It is thought that by attributing the cause of the condition to a medical issue, it can relieve the individual of personal responsibility for the condition; it can be something that has happened to them, and not something defective about them. However, diagnoses can be counterproductive to this goal. When social conditions such as involuntary childlessness are renamed as medical diseases, the emphasis is taken off the conflict between an individual’s state and social and cultural norms and reframed as conflict within an individual (Becker & Nachtigall, 1992). Rather than see the issue as one where an individual is not living up to cultural norms, and thus one in which the issue could be with the individual *or the culture*, it is framed as an issue with the individual’s body, and no responsibility is attributed to the dominant pronatalist ideology in society, the responsibility lies in the individual’s body. Further, when a social condition is medicalized, the options for courses of action to deal with the issue are reduced to one: medical treatment/intervention (Becker & Nachtigall, 1992). Social solutions

which were predominant in the past (such as remaining childless, adoption, and other ways of incorporating children into daily life) are rarely considered as options today following the implementation of medical interventions for involuntary childlessness. . Thus, transforming involuntary childlessness into the medical disease “infertility” may not reduce stigma, and may in fact amplify feelings of pathology and abnormality, and limit the options of those who experience infertility.

A number of factors may contribute to medicalization of otherwise social conditions. Some of these factors include: “the diminution of religion, an abiding faith in science, rationality, and progress, the increased prestige and power of the medical profession, the American penchant for individual and technological solutions to problems, and a general humanitarian trend in western societies” (Conrad, 1992, p. 213). More recently, the proliferation of mass media has been considered a driving force in the process of medicalization (Conrad, 2005).

2.3 News Coverage of Health Issues

News coverage of health issues often contains a lack of detailed health information (Quintero Johnson, Sionean, & Scott, 2011), a lack of follow-up information indicating other sources of information on the topic (Niederdeppe, et al., 2010), and an impression of a more concrete understanding of the issue than is currently scientifically accepted (Schwartz, Woloshin, & Baczek, 2002). In addition, the media coverage regarding health issues is often not in proportion with the actual prevalence of that health issue. For instance, the media relays far more information pertaining to sensationalized, albeit relatively rare, health issues such as SARS or West Nile, than about issues with higher population prevalence such as heart disease or diabetes (Berry, Wharf-Higgins, & Naylor, 2007). Even within disease categories, media coverage is often disproportional to prevalence. For example, approximately 45% of cancer-related news has

been found to focus on breast cancer, while only 5% concentrates on lung cancer, even though the prevalence of lung cancer is substantially higher (Berry, et al., 2007). Further, the media tends to devote disproportionate attention to more sensational but relatively uncommon causes of death (Frost, Frank, & Maibach, 1997).

That being said it is important to note that the sensationalizing of some issues is appropriate and arguably not always a negative. For instance, rallying support around social issues or great social accomplishments perhaps should be sensationalized, because some events and occurrences are extraordinary and attention should be provided to those issues. However, it may be considered problematic when the issues receiving large amounts of news coverage do so only because they seem extraordinary, and other, less shocking, but perhaps more prevalent issues are relatively ignored. At the best of times, people have great difficulties interpreting probabilities, and making judgements regarding the probability for which an event is likely to occur (Kahneman & Tversky, 1984). In order to ease the burden of making such judgements, we often rely on heuristics or mental short-cuts, rather than going through the complicated calculations to determine probability (Tversky & Kahneman, 1974). One such heuristic, the availability heuristic, involves making a probability judgement based on the ease with which instances can come to mind (Tversky & Kahneman, 1974). In essence, under this heuristic, outcomes that are more easily brought to mind are judged to be more probable.

Given the tendency of the news media to disproportionately relay information regarding sensational, yet less common, health issues, it is quite likely that these health issues become more salient to the public. According to accessibility principle, this disproportionate coverage and increased saliency then, in turn, will likely make these health issues more accessible in memory, and therefore more easily brought to mind. According to the heuristic principle of

availability, the public would then judge these health issues to be more probable outcomes (i.e., more common) than they actually are. This highlights the media's agenda setting capability. Agenda setting in the media can have immediate public health consequences. For instance, the amount of news coverage on the flu virus has been found to predict physician visits for the flu, while controlling for the number of actual cases of the flu (Trumbo, 2012).

Consumers of news coverage of health studies often lack an understanding of the necessary concepts of health risk assessment (e.g. prevalence versus incidence), and tend not to engage in critical thinking as applied to health issues (Covello & Peters, 2002). Pairing this with the inclination to rely on heuristics and the disproportionate coverage of health issues in the media, these news consumers may have a limited ability to “evaluate the quality of medical or scientific studies, weigh the value or contribution of a single scientific or medical study or understand and interpret risk probabilities, especially with very small probabilities and unfamiliar risks” (Covello & Peters, 2002, p. 380).

Canadian print news has been reporting an increase in the rate of infertility for the past 30 years. In 1979 a *Globe and Mail* headline read “Is Infertility on Increase?”; in 1986 a *Toronto Star* headline read “Infertility on Increase, Doctor's Say”; in 1994, the *Edmonton Journal* reported an “Alarming Rise in Infertility World Wide” (Moysa); and in 2012 the *National Post* reported “Infertility on Rise in Canada; Double since 1992” (Kirkey). The increase in infertility is a topic of widespread public interest, and it is not surprising that it receives media attention. However, given the potential power of the media to influence public perceptions of, and reactions to, an issue, it is important to critically examine the way issues are constructed in the media and the effects of that media coverage.

CHAPTER 3

STUDY 1: THE CONSTRUCTION OF INFERTILITY IN CANADIAN PRINT NEWS

Researchers have examined how the media frame a variety of health issues. Sudden acute respiratory syndrome (SARS) has been most often framed in terms of risk, by credible sources, using strong language (Berry, Wharf-Higgins, & Naylor, 2007), and also using the metaphor of a “killer” (Wallis & Nerlich, 2005). Mothers of children with fetal alcohol spectrum disorder (FASD) have been framed as both victims and as dangerous (Connelly-Ahern, & Broadway, 2008). The measles, mumps rubella (MMR)-autism vaccination “scare” was framed in terms of culpability or blame (Holton, Weberling, Clarke, & Smith, 2012). Finally, obesity has primarily been framed as a fatalistic and individual issue (Shugart, 2011).

The purpose of this study is to investigate how Canadian news media have framed infertility. This study will utilize the coding framework developed by Chang (2012) to determine if infertility news adheres to the frames found in health news in general. In order to determine the mediums to which the results are generalizable, one news medium will be the focus of the study. Specifically, print news will be the focus of the present study as this is the first study of its kind in the Canadian context and print news is arguably the most established news in Canada. Given that that the public often relies on news for health information, it is important to consider how that information is delivered. As such, the study’s research questions include: (1) What kind of news frames do infertility-related (a) news headlines and (b) news articles employ?; (2) What is framed as the “cause” of infertility?; (3) What is framed as the “solution” to (or ways to cope with) infertility?; (4) What proportion of articles provide a reference to the target? (5) What proportion of articles provide follow-up information?; and (6) What proportion of the articles provide limitations of the target study?

3.1 Method

3.1.1 Sampling

A census (all articles from a given time period; see Krippendorff, 2004) of English Canadian new stories related to infertility was obtained using the *Canadian Newsstand Major Dailies* Database. *Canadian Newsstand Major Dailies* is a ProQuest database which contains major Canadian newspapers and news sources such as *The Vancouver Sun*, *The Calgary Herald*, *The Gazette*, *The Ottawa Citizen*, *The Star-Phoenix*, *The Toronto Star*, *The National Post*, and *The Globe and Mail*. The articles were thus representative of both regional and national English language newspapers. The census included all articles that contained the search word “infertility” within either the headline or article content that were published in 2012. This search resulted in 222 articles. The census was screened for relevance to a small degree. For instance, some Classifieds section entries were included in the return from the search term “infertility” because of support group listings or other public events. Because these were not news articles they were screened out of the analysis. The final sample to be analyzed was composed of 157 articles.

As per Neuendorf (2002), a pilot sample equal to 5% ($n = 12$) of the articles in the full study sample was obtained from the *Canadian Newsstand Major Dailies* in order to assess the coding scheme and identify problematic variables or categories. This 5% was randomly selected from articles published in 2011 (the year prior to target year) using the same search word, “infertility”.

3.1.2 Coding Procedure

The headlines and the text of each article were coded separately in order to investigate if the prevalence of frames differed between the two. Both the headlines and text were categorized with respect to: (1) alarm frames (high versus low); (2) coping frames (high versus low); (3)

gender focus; and (4) attributions of cause and/or potential solutions. The text of each article was also examined for the inclusion of scientific evidence or studies, and coded for whether it included the complete reference to the published scientific study (or enough reference information to enable a reader to locate the original publication), any discussion of the limitations of the research, or where to locate follow-up information.

Indicators of alarm included severity, vulnerability, and alertness. Headlines and text that contained elements of high severity, high vulnerability, or high alertness were coded as high alarm. For example, wording suggesting that infertility has severe consequences (e.g., “Infertility produces chronic sorrow”) or that the public is vulnerable to infertility (e.g., “Canada’s infertility rates rising”), or that the general public should be alert to the issue (e.g., “Infertility can sneak up on you”) would result in a coding of a high alarm frame. Alternatively, wording suggesting that infertility has mild or positive consequences (e.g., “Childless couples experience greater levels of well-being”), or that a negative outcome is unlikely (e.g., “Few people’s fertility affected by air pollution”), or that there is no need to panic (e.g., “The infertility myth: It’s no epidemic experts say”) would be coded as a low alarm frame.

In the case of the text of the article, at least half of the text had to feature alarm information to be considered to reflect an alarm frame. News reports that did not include information related to severity, vulnerability, or alertness were coded into a not present category. Because within this coding procedure an article could be coded as containing high alarm with regards to one indicator, but low alarm according to another indicator, a guiding majority decision rule was adopted. That is, if, in a single article, two out of the three indicators (severity, vulnerability, and alertness) designated a low alarm coding, while one designated a high alarm, the ultimate coding of this article would be designated by the majority of indicators (in this example the article

would be codes as low alarm as the majority of indicators reflected a low alarm frame).

Indicators of coping included internal efficacy (detection/prevention/accepting the condition), and external efficacy (treatment/solution). Headlines and text that contained high internal or external coping messages were coded as high coping frames. Content with high coping frames imply people can take actions to detect and prevent infertility (e.g., “Egg freezing: A new method to prolong your fertility”) or that the health issue can be treated (e.g., “IVF success rate increasing”). Low coping frames suggest the unlikelihood of preventing and detecting the problem (e.g., “Anyone may experience unexpected infertility”) and the challenges of finding a treatment or solution (e.g., “Most with infertility problems remain childless for life”). In the case of the text of the article, at least half of the text had to feature coping information to be considered to reflect a coping frame. Again, articles that did not include information related to either internal or external coping were coded into a “not present”.

An independent coder, unaware of the research questions, and the primary researcher individually coded the pilot sample in order to establish reliability. Once satisfactory reliability was achieved in the pilot sample, and both coders felt comfortable with the coding criteria, coding of the target articles commenced. Inter-rater reliability was calculated on an on-going basis using every article, for the entirety of the coding, in order to detect potential coder drift (insufficient adherence to the decision rules for coding). Any major discrepancies in coding were resolved through discussion. Across the headline categories reliability coefficients (Cohen’s *kappa*) ranging from $\kappa = .664$ to $\kappa = 1.0$ were calculated (See Table 3-1). Across content categories reliability coefficients ranging from $\kappa = .705$ to $\kappa = .827$ were calculated (See Table 3-2). Typically $\kappa = .61$ - $\kappa = .80$ is considered substantial agreement (Viera & Garrett, 2005), indicating that sufficient reliability was established.

Table 3-1

Inter-Rater Reliability Statistics by Category (Headlines)

<i>Category</i>	<i>Kappa (κ =)</i>
Severity	.888
Vulnerability	1.0
Alertness	.664
Internal Coping	.745
External Coping	.777
Gender	.720
Medicalization	.868

Table 3-2

Inter-Rater Reliability Statistics by Category (Content)

<i>Category</i>	<i>Kappa (κ =)</i>
Severity	.730
Vulnerability	.749
Alertness	.719
Internal Coping	.705
External Coping	.746
Gender	.721
Reference	.805
Limitations	.827
Follow-Up	.802
Medicalization	.687

3.2 Results

A summary of the number and percentages of headlines and articles that contained each of the frame types is provided in Table 3-3.

3.2.1 Headlines

As Table 3-3 clearly illustrates, very few headlines employed alarm frames (n=21, 13%), but of those that did, the vast majority (90%) were high alarm frames. Additionally, it appears that, although headlines encompassing coping frames were rare (n=10, 6%), most of these were categorized as high coping (n=8; 80%). Further, when headlines employed a gendered frame (n=17), it most often was female-specific (71%) with male-specific frames being relatively rare (12%). Finally, if a headline adhered to a construction of infertility (n=41), the vast majority were medicalized (93%), while only a small minority presented an alternative construction of infertility (7%).

Table 3-4 presents the prevalence of alarm indicators in news headlines with an alarm frame. Within the subset of high alarm headlines (n=19), most involved either high vulnerability (n=9; 47%) or high severity (n=8; 42%) as an indicator of alarm. None of the headlines contained multiple indicators of alarm. Table 3-5 presents the prevalence of coping types in headlines with coping frames. In the high coping frames, external coping was more prevalent than internal coping for (63% versus 37%).

3.2.2 Content

As Table 3-3 shows, the content of the articles displayed considerably more frames than did headlines. When articles ascribed to an alarm frame (n=80) the vast majority were categorized as high alarm (96%) while only a minority encompassed low alarm frames (4%). When articles included a coping frame (n= 75), slightly more involved high coping (57%) than

Table 3-3

Prevalence of Alarm, Coping, Medicalization, and Gendered Frames in Infertility Print News

		<i>Headline</i> <i>N=157</i>		<i>Content</i> <i>N=157</i>	
<i>Frame Type</i>		<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
<i>Alarm</i>	High Alarm	19	12.1	77	49.0
	Low Alarm	2	1.2	3	1.9
	Not present	136	86.6	77	49.0
<i>Coping</i>	High Coping	8	5.1	43	27.3
	Low Coping	2	1.2	32	20.4
	Not present	147	93.6	92	58.6
<i>Medicalization</i>	Medicalized	38	24.2	99	63.1
	Alternative Construction	3	1.9	1	.6
	Not present	116	73.9	58	36.9
<i>Gender</i>	Female	12	7.6	48	30.6
	Male	2	1.3	4	2.5
	Both	3	1.9	38	24.2
	Not present	140	89.2	67	42.7

Table 3-4

Prevalence of Alarm Indicators in Articles that Contained an Alarm Frame

		<i>Headline</i> <i>n=21</i>		<i>Content</i> <i>n=80</i>	
<i>Indicator</i>		<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
<i>Severity</i>	High Severity	8	38.1	69	86.3
	Low Severity	1	4.8	2	2.5
<i>Vulnerability</i>	High Vulnerability	9	42.9	34	42.5
	Low Vulnerability	1	4.8	2	2.5
<i>Alertness</i>	High Alertness	2	9.5	20	25.0
	Low Alertness	0	0	2	2.5

Table 3-5

Prevalence of Coping Types in Articles that contained a Coping Frame

		<i>Headline</i> <i>n= 11</i>		<i>Content</i> <i>n= 75</i>	
<i>Coping Type</i>		<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
<i>Internal Coping</i>	High Internal Coping	3	27.3	12	16.0
	Low Internal Coping	2	18.2	15	20.0
<i>External Coping</i>	High External Coping	5	45.5	34	45.3
	Low External Coping	1	9.1	27	36.0

low coping (42%). Further, when articles employed a gendered frame (n=90), it most often was female-specific (53%) with male-specific frames being relatively rare (4%). Finally, if an article adhered to a construction of infertility (n=100), the vast majority were medicalized (99%), while only a small minority presented an alternative construction of infertility (1%).

Table 3-4 presents the prevalence of alarm indicators in news articles with an alarm frame. Within the subset of articles high in alarm (n= 77), severity was the most prevalent indicator (90%), followed by vulnerability (44%) and alertness (26%). Of the articles deemed to be presenting infertility as high alarm (n=77), 55% contained only one of the three high alarm indicators, 38% contained two of the indicators, and 10% contained all three of the indicators. Of the three articles coded as low alarm, two exhibited one high alarm indicator in addition to the two low alarm indicators which accounted for the articles categorization. Thus although these articles were ultimately coded as low alarm, they had indications of high alarm as well.

Table 3-5 presents the coping types in news articles with a coping frame. When articles a coping frame, across both high and low coping frames, external coping was more prevalent than internal coping. Thus, discussion of external coping, whether efficacious or not, was more prevalent than that of internal coping. Note that an article could be coded as containing both high external and internal coping, or high external and low internal coping, etc.

Thirty-six articles reported on findings from a scientific study. None of these provided a reference considered complete enough for a layperson to find the original scientific report. Some articles did provide partial references, however they were generally in the form of “An article published in the Journal of _____ reported that...) accompanied by no issue number, volume number, publication date, or page number listed. Authors were rarely listed. In essence, no articles provided an adequate reference to the target scientific study. Of the articles that reported

on a scientific study (n=36) the vast majority (n=32; 89%) did not provide study limitations while a small minority (n=4; 11%) did. Forty-four articles were considered as those for which follow-up information would be applicable. However, only a small minority of these articles (n=7; 16%) provided follow-up.

Tables 3-6 and 3-7 summarize the results of the analysis of causes of and solutions to infertility respectively. Eighty-seven articles contained a reported cause of infertility. As Table 3-6 clearly demonstrates, delay of childbearing was the most common cause cited for infertility (n=36; 41%). All other causes were far less commonly cited, with less than 15% of the articles citing any of the other nine causes. Thus it appears that although many risk factors are presented for infertility, having children at a delayed age is the most common cause cited. In total, 108 articles presented a reported 'solution' to infertility. In vitro fertilization (IVF) was by far the most common solution discussed for infertility (n=50; 46%). As Table 3-7 clearly demonstrates, all other solutions were far less commonly presented, with less than 10% of the articles citing any of the other 13 solutions. Thus although many alternatives are present in media reporting, in vitro fertilization is by far the most discussed way to cope with infertility.

3.3 Discussion

The results of this study contribute to our understanding of the social construction of infertility through news framing. The content analysis revealed that news media ascribe to a definition of infertility that constructs infertility as a serious, a prevalent, and predominantly a women's *disease*, for which high levels of external coping are possible through medical intervention. The content analysis also revealed the news media construct infertility as a problem for which the cause is delayed childbearing, and the solution is in vitro fertilization. Cumulatively, this analysis suggests that news media play a role in disseminating this particular

Table 3-6

Prevalence of Causes Cited for Infertility in Canadian Print News Articles

<i>Cause</i>	<i>Frequency</i> <i>n=87</i>	
	<i>n</i>	<i>%</i>
Delay of childbearing	36	41.4
Medical conditions	12	13.8
Obesity	9	10.3
Sexually transmitted infections	9	10.3
Alcohol/drugs/smoking	8	9.2
Stress	5	5.7
Diet	3	3.4
Sexual orientation	3	3.4
Female circumcision	1	1.1
Pollution	1	1.1
Total	87	100

Table 3-7

Prevalence of Solutions Cited for Infertility in Canadian Print News Articles

<i>Solution</i>	<i>Frequency</i> <i>n=108</i>	
	<i>n</i>	<i>%</i>
In Vitro Fertilization	50	46.2
Egg Freezing	8	7.4
Surrogate	7	6.5
Fertility Drugs	7	6.5
Purchasing Embryos	6	5.6
Other technologies	6	5.6
Earlier Childbearing	6	5.6
Adoption	5	4.6
Living Childfree	3	2.8
Acupuncture	3	2.8
Mediation/De-stressing activities	3	2.8
Preventing STIs (using condoms)	2	1.9
Continued Attempts	1	.9
Sperm Donation	1	.9
Total	108	100

construction of infertility, and very infrequently reports any alternatives to this understanding. By disseminating this particular construction infertility, the media may be facilitating the medicalization of the condition. They may be contributing to the construction of childlessness as a disease, which might exacerbate the distress associated with infertility.

The content analysis also suggested that, like other health news (Niederdeppe, et al., 2010; Quintero Johnson, et al., 2011), print news focussing on infertility rarely provides follow-up information, or limitations or references for the scientific studies on which they report. This illustrates that along with a very particular construction of infertility, Canadian print news may currently be providing very little information on where to find other information about infertility, or where to find supporting information for their story.

In terms of framing theory, the media have clearly adopted a very particular problem definition, causal interpretation, moral evaluation, and treatment recommendation for infertility. As mentioned in the literature review, frames that contain all four of these associative connections are generally considered the most able to influence the public's understanding of an issue (Tewksbury & Scheufele, 2009). They provide an entire script that audience (and journalists) may become familiar with and come to expect when encountering individuals who experience infertility or other stories about infertility. Like content analyses of health news in general (Chang, 2012), this analysis found that high alarm framing was nearly ubiquitous in news that contained alarm frames. Unlike Chang (2012), this study found that infertility is framed as a condition for which high coping is possible, although that coping is external coping (not strategies that an individual can accomplish without external influences). Correspondingly, IVF was the treatment recommendation most often suggested. The causal interpretations put forth for infertility were disproportionately attributed to women's issues, and most often was

noted as delayed childbearing. Finally, the vast majority of articles medicalized infertility. Thus the media propagate a very consistent construction of infertility, adhering to the biomedical construction.

It appears rather incongruous that the biomedical construction of infertility as disease is disseminated in news articles that also name its most common “cause” as delayed childbearing. That is, any of the non-normative/pathological medical conditions that underlie infertility (e.g. endometriosis, damaged fallopian tubes) pale in the amount of news coverage they receive (less than 15% of articles that mentioned a cause) compared to that received by delayed childbearing (just over 40% of articles that mentioned a cause%). Labeling delayed childbearing as a “cause” of a “disease” may be quite a misnomer as experiencing a decline in fertility is natural and normative biological aspect of aging for women. Headlines that report “Infertility on rise in Canada; Double since 1992” (Kirkey, 2012) which then go on to report delayed childbearing as the main cause of this increase, may be inappropriately reporting events. Perhaps it is the rate of involuntarily childlessness among older, naturally less fertile women that has increased, and the headlines should alternatively read “Natural age-related decline in fertility more prominent today than in 1992 as more women wait till they are older to have children”. Granted, this is a less catchy headline.

This study illuminates to some degree how specific aspects of society act as the mechanisms of the medicalization of infertility. The media, as an important educative institution in society, have the ability to shape the public’s understanding of phenomena and experiences. Journalists (like the public in general) rely on frames to give to meaning to events and experiences. Further, societal values, government, corporations, and journalistic norms all influence journalists in terms of the frames they choose to utilize when reporting on any given

issue. Currently, Canadian print news journalists are utilizing a very limited, biomedical construction of infertility as an alarming women's disease.

This rather ubiquitous framing of infertility may have repercussions for news consumers. It may affect the cognitive processes of what considerations are accessible to them about infertility, and also, what considerations are even applicable to infertility at all. That is, when reflecting on infertility, news consumers will predominantly have this biomedical, alarmist construction of infertility accessible to them. With only this limited construction available to them, they will only have limited view or understanding of what infertility *is* and, as such, may only have a limited range of responses to infertility. When one understands infertility as an alarming disease, it may be difficult to respond to infertility (whether one's own experience or others') with anything but negative emotions or cognitions.

Arguably, the media are conflating infertility with involuntary childlessness. Framing infertility with high alarm and very rarely with low alarm would suggest that infertility is uniformly distressing for all that experience it. This renders invisible the experience of those who may experience only very temporary distress, or none at all, but would still be considered technically infertile by the medical definition. Further, this conflation may contribute to the widespread pronatalism in Canadian society. When infertility is universally assumed to be distressing or alarming, it makes invisible the experiences of those who do not experience distress or alarm over the condition, and it makes the necessity of having children more prominent; it suggests that *everyone must* want to have children, because apparently everyone who cannot is distressed. This conflation also negates the experience of those who, though not technically infertile, may suffer profound distress over a childless state (e.g., members of the LGBT community, or individuals who are not in a sexually active heterosexual relationship). It

may make their condition seem less real or less legitimate compared to those who have a medical disease or who have delayed childbearing, but who are appropriately conforming to the social norms of active heterosexuality.

More evidence for the potential pronatal ideology of the media is the finding that remaining childfree as a means of coping with infertility was mentioned in only three of the news articles. All other articles involved means with which to improve one's chances of obtaining children. The medicalized ideology of the media was also quite clear in this analysis as in vitro fertilization was mentioned as a treatment recommendation almost as often as all other treatment or coping mechanisms combined.

In contrast to media as participants in the medicalization of infertility, recent content analyses of academic journals have demonstrated that academic articles have significantly improved in the past decade in producing more varied and nuanced constructions of the experiences of infertility (Greil, Slauson- Blevins, & McQuillan, 2010). In the past ten years academics have been producing a construction of infertility that more honestly maps onto the experiences and narratives of individuals who experience infertility, than does the rather stringent biomedical construction they previously perpetuated. It is apparent that print journalists may be late to catch on to the more nuanced constructions evident in the social sciences, or that perhaps they, as members of society that internalize dominant mind-sets themselves, still perceive the medical community as the "experts" when it comes to health issues such as infertility. Given that there are a variety of factors that contribute to journalists' choice of frames, further studies could investigate how journalistic norms and societal values combine to contribute to the rigid construction of infertility found in Canadian print news today.

Some limitations of Study 1 should be noted. Firstly, Chang developed his coding strategy

within another cultural context (Taiwan) and for general health news being reported in Asia. This brings into question its applicability for analyzing infertility related news in a Canadian context as the news reporting may differ by culture and subject. That being stated, the generalist nature of the coding strategy is a strength of the system. That is, since it was created for health news in general, it can be applied to individual health issues, without adaptation. And, in order to gain insight into the news on infertility that the previously established strategy did not tap into, additional codes were created, for instance for cause and treatment. Also, although the coding strategy was first used in a content analysis of Taiwanese news, it was published in English. Furthermore, one of the common critiques of framing research is that it exhibits a lack of theoretical and methodological unity, with a resultant lack of comparability across studies (Matthes, 2009). Using a predetermined coding strategy, with established frames, allows for comparison across studies and contributes to more consistent theory and methodology.

Another potential limitation in Study 1 is that the primary author was one of the coders. Although this could raise concerns about potentially biased coding, an independent coder was utilized to guard against this potential bias. It is also important to note that just over half of the articles contained alarm frames ($n = 80$), and a similar number ($n = 77$) contained no alarm frames. Although this would suggest that only half of the news articles referred to alarm at all, it is important to note that this sample of articles contained all those articles published in Canadian print news in 2012 that had a key word “infertility”. Thus many articles did not focus on infertility, and only mentioned it as a peripheral or supplementary factor in a story. This was indeed the case in many of the articles that did not adhere to a (high or low) alarm frame.

Finally, this content analysis utilized a sample of Canadian print news articles. Although it may be reasonable to assume that Canadian print news is not divergent from other forms of

Canadian media, future studies could examine the construction of infertility in a range of media such as internet social media or popular magazines in order to make more concrete generalisations. Likewise, it should be noted that only English language Canadian print news was analyzed. In order to make generalizations regarding all Canadian print news, French (the other official Canadian language) newsprint could also need to be analyzed. Media in other countries and cultures could be analyzed as well.

CHAPTER 4

STUDY 2: THE EFFECTS OF ALARM FRAMES ON CONSUMERS OF INFERTILITY NEWS

Study 1, a content analysis of Canadian Print news focussing on infertility concluded that, like health news in general, articles on infertility tended to adopt a high alarm framing strategy. Of the 157 articles related to infertility appearing in 2012, approximately one-half employed alarm frames ($n=80$; 51%), and virtually all of these met the criteria for categorization as high alarm. The most commonly cited cause of infertility was delayed childbearing and the most frequently presented way to cope with infertility was in vitro fertilization (IVF). Further, infertility was most often constructed as a women's issue within these news articles. Unlike health news in general (Chang, 2012), this analysis revealed that the news articles on infertility contained high coping frames. However, the coping suggested was most often external coping through medical intervention. Cumulatively, this analysis suggests that Canadian print news plays a role in disseminating a particular construction of infertility, one that may conflate involuntary childlessness with infertility, and very infrequently reports any alternatives to this understanding.

Given the relatively homogenous framing of infertility in print news, it is important to consider how the presentation of infertility affects the consumers of infertility news. Thus, the specific objective of the Study 2 was to examine if the use of high alarm strategies in news media focusing on infertility impacts public perception of, and reaction to, infertility. Further, we examined if the amount of exposure to these frames moderate the impacts of the frames on the audience. Based on the findings of Chang and framing theory in general as outlined in the literature review (2012) we predict that:

H1: Exposure to news articles focusing on infertility that employ high alarm frames will evoke:

(a) greater levels of personal fear regarding infertility; (b) higher perceived severity of infertility; (c) higher perceived personal vulnerability to infertility; (d) higher levels of worry about infertility; but no (d) higher perceived efficacy nor (f) more knowledge about infertility than will exposure to articles that employ low alarm frames.

H2: Dosage level will moderate the expected significant main effects of alarm condition outlined in H1. Specifically, exposure to two high alarm news articles on infertility will elicit: (a) greater levels of personal fear regarding infertility; (b) higher perceived severity of infertility; (c) higher perceived personal vulnerability to infertility; and (d) higher levels of worry about infertility than will exposure to a single high alarm article. In contrast, exposure to two low alarm news articles on infertility will elicit: (a) lower levels of personal fear regarding infertility; (b) lower perceived severity of infertility; (c) lower perceived personal vulnerability to infertility; and (d) lower levels of worry about infertility than will exposure to a single high alarm article.

4.1 Method

4.1.1 Participants

Participants were recruited via the University of Saskatchewan psychology participant pool. Participants received one research credit towards the introductory psychology course they were currently enrolled in as compensation for participation in the study. One hundred and thirty-nine participants were recruited for this study. Five participants were excluded from the analysis because they already had children and as such were not expected to psychologically react to infertility in the same manner as childless individuals intending to have children in the future, the target population of the present study. An addition three participants were excluded from the analysis because they reported an intention to remain childfree and as such did not represent the specified target population. The final sample contained 131 participants. Of those

that reported their sex, 79 participants were women, while 27 were men. The mean age of participants was 19.5 years ($SD = 2.0$) with a range of 17-28. The majority of participants (49.6%) self-identified as “Caucasian” (49.65), and “straight” (65.6%). The research was approved by the University of Saskatchewan Behavioural Research Ethics Board (See Appendix A)

4.1.2 Procedure

Participants were randomly assigned to a high or low alarm condition, and a one or two article condition. Those assigned to the one article condition read an additional “control” article on an irrelevant issue (ATMs that respond to cellphone instructions) to ensure the amount of reading was equal for each group. Upon arriving for the study, participants read a consent form (See Appendix B) explaining the general details of the study. After signing the consent, participants read two articles according to the study condition they were randomly assigned. After reading the articles participants responded to the measures via a self-administered questionnaire. Participants read the articles and completed the measures in groups of 5-30 in a small, quiet, university classroom. Upon completion of the study, all participants were debriefed (See Appendix C). Participation in the study took less than 30 minutes.

4.1.3 Materials

4.1.3.1 News Articles. News articles were selected from the content analysis of Canadian print news outlined in Study 1. Two independent coders rated articles. “High alarm” articles were those that constructed infertility as a severe disease, which women (specifically) are highly vulnerable to and to which they should be highly alert. “Low alarm” articles were those that constructed infertility as something that is not severe, that people are not highly vulnerable to, and that people need not be on the alert for. The news articles were published in 2012, obtained

from *Canadian Newsstand*. The articles chosen from the content analysis for the experiment were those that were rated as high alarm on multiple indicators (severity, vulnerability, and need for alert). There were only three articles categorized as low alarm in the Study 1. Of these, two also contained indicators of high alarm. Thus, only the one low alarm article that was only categorized as low alarm was garnered from the content analysis. In order to find another low alarm article, online news was reviewed, and an article was chosen as potential second low alarm article.

In order to provide further evidence for the content validity of the articles chosen for the present experimental study, a small pilot study of the articles was conducted with a psychology research team. The team of eight graduate students and faculty in psychology rated the articles for alarm in terms of the indicators severity, vulnerability and need for alertness. These ratings were aggregated to determine the articles that were considered the most and least alarming to the group. From these rating the two rated as the most alarming were selected for the high alarm stimuli articles (See Appendix D) and the two rated as the least alarming were selected for the low alarm articles (See Appendix E). Finally, the “control” article was chosen from online news as one that was approximately the same length as the stimuli articles but regarding an issue that could not be associated with infertility, health, or alarm (See Appendix F).

4.1.4 Measures

4.1.4.1 Fear. Fear of infertility was measured with a scale adapted from Champion and colleagues (2004) Champion Breast Cancer Fear Scale. The scale was adapted by replacing “breast cancer” with “infertility” in the agreement statements. The Fear of Infertility Scale ($\alpha = .915$) measures agreement with eight statements on a 5 point Likert-type scale anchored at 1 = strongly disagree and 5 = strongly agree. Samples statements include “The thought of infertility

makes me scared” and “When I think about infertility, I feel nervous”. To create an individual’s scale score, the scores on each item are totaled and their average is calculated. Thus scores range from one to five, with higher scores indicating more fear of infertility (See Appendix G).

4.1.4.2 Perceived severity. Perceived severity was measured with a scale adapted from the “consequences” section of Moss-Morris et al.’s (2002) Revised Illness Perception Questionnaire. The scale was adapted to target perceived severity of infertility by substituting “infertility” for “my illness” in the agreement statements of the scale. The Perceived Severity of Infertility Scale (PCIS) measures agreement with statements regarding the consequences of infertility and is measured with a 5 point Likert-type scale anchored at 1 = strongly disagree and 5 = strongly agree. A sample statement is “Infertility is a serious condition”. There is one reverse-scored item, item three. To create the scale score, the scores on each item are totaled (with the third item reversed) and the average is calculated. Thus scores range from one to five, with higher scores indicating more perceived severity of infertility (See Appendix H).

The initial PCIS was comprised of six items. In order to determine the internal consistency reliability (the extent to which they all measure one, relatively unified construct) the Cronbach’s alpha was calculated. As the initial Cronbach’s alpha was rather low ($\alpha = .618$) the items were reassessed conceptually to determine if some were less representative of the construct of perceived personal severity of infertility than others. Items four (“*Infertility strongly affects the way others see those who experience it*”) and five (“*Infertility has serious financial consequences*”) were assessed as potentially tangential to the construct of perceived severity, as item four may tap into stigma, and item five financial consequences, while the other items reflect more general impact to one’s life. The internal consistency statistic mirrored this assessment as the Cronbach’s alpha with items four and five removed was slightly improved ($\alpha = 0.643$)

compared to the initial measure. Thus, scores on the reduced, four-item scale were used for the remainder of the study.

4.1.4.3 Perceived vulnerability. Perceived vulnerability was measured with a scale adapted from Napper, Fisher, and Reynold's (2012) Perceived Risk of HIV Scale. The scale was adapted by replacing "HIV infection" with "infertility" in the scale's statements and questions. Sample items for the Perceived Vulnerability to Infertility Scale (PVIS) include "What is your gut feeling about how likely you are to be infertile?" anchored at 1 = extremely unlikely to 5 = extremely likely and "I think my chances of being infertile are..." anchored at 1 = zero to 5 = very large. There is one reverse-scored item, item four. To create the scale score, the scores on each item are totaled (with the fourth item reversed) and the average is calculated. Thus scores range from one to five, with higher scores indicating more perceived vulnerability to infertility (See Appendix I).

The PVIS was originally comprised of eight items. In order to determine those items' internal consistency reliability (the extent to which they all measure one, relatively unified construct) their Cronbach's alpha was calculated. As the initial Cronbach's alpha was rather low ($\alpha = .769$) the items were reassessed conceptually to determine if some were less representative of the construct of perceived vulnerability than others. Items three ("*Picturing myself being infertile is something I find.*") with response options ranging from "very hard to do" to "very easy to do") and six ("*There is a chance, no matter how small, I could be infertile*") were assessed as perhaps not directly targeting the construct of perceived vulnerability, as item their wording may be unclear. The internal consistency statistic mirrored this assessment as the Cronbach's alpha with items three and six removed was improved ($\alpha = 0.813$) compared to the initial measure. Thus, scores on the reduced, six-item scale were used for the remainder of the study.

4.1.4.4 Worry. Worry About Infertility was measured with seven items ($\alpha = 0.894$), developed for this study due to the lack of an established measure in the relevant literature. One item was adapted from Chang (2012): “When you think about your possible infertility risk, how worried do you feel?” The five responses range from 1 = not worried at all to 5 = very worried. There is one reverse-scored item, item five. To create the scale score, the scores on each item are totaled (with the fifth item reversed) and the average is calculated. Thus scores range from one to five, with higher scores indicating more worry about infertility (See Appendix J).

4.1.4.5 Prevention Efficacy. A scale adapted from Chang (2012) was used to measure prevention efficacy. Prevention efficacy consisted of two items: “how capable do you feel of preventing yourself from being infertile?” and “how likely do you feel to be able to prevent yourself from being infertile?” for which the responses ranged from 1 = extremely unlikely to 5 = extremely likely” ($\alpha = .821$). To create the scale score, the scores on each item are totaled and the average is calculated. Thus, scores range from one to five, with higher scores indicating higher prevention efficacy (See Appendix K).

4.1.4.6 Coping Efficacy. Management/coping efficacy was measured with two items: “How likely do you feel it is that you could effectively cope with being diagnosed infertile?” and “How capable do you feel you are to manage infertility?” ($\alpha = 0.713$) for which the responses ranged from 1 = extremely unlikely to 5 = extremely likely”. To create the scale score, the scores on each item are totaled and the average is calculated. Thus, scores range from one to five, with higher scores indicating higher coping efficacy (See Appendix L).

4.1.4.7 Knowledge of Infertility. A measure of knowledge of infertility was created for this study in the form of an 12-item multiple choice quiz. Questions were based on information available to the public, primarily from the “frequently asked questions” section of online

infertility awareness websites. To create an individual's knowledge score, the scores on each item were totaled. After reviewing the quiz, post-administration, item 10, (*What is generally considered to be advanced paternal age?*) was removed from as it was determined to be an ambiguous question, as advanced paternal age (unlike advanced maternal age) has not been concretely defined in the scientific literature. Thus, scores range from one to eleven, with higher scores indicating more knowledge about infertility (See Appendix M).

4.1.4.8. Demographic Information. In order to better understand the sample participating in the study, a series of demographic questions were posed to the respondents (See Appendix N).

4.2 Results

Descriptive statistics (means, standard deviations) delineated by group membership are reported in Table 4-1. It is important to note that both the low and high alarm groups scored around the midpoint on fear of infertility, vulnerability to infertility, and worry about infertility. This suggests that as a whole, participants did not exhibit particularly high nor low levels of these variables. Both groups did, however, score rather high on the severity of infertility scale, indicating that they believe that infertility is a serious condition with major consequences for the lives of those that experience it. Further, both groups scored around the midpoint on both prevention and coping efficacy, with slightly higher scores on coping than prevention efficacy. Finally, both groups scored below the midpoint on the knowledge about infertility quiz, indicating that regardless of group membership, participants on average had little knowledge about infertility. Given the traditional academic pass threshold of 50%, both groups “failed” the infertility quiz.

Table 4-1

Group Differences on Study Variables

	<i>Low Alarm</i> <i>n = 66</i>		<i>High Alarm</i> <i>n = 65</i>		<i>P-Value</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Fear*	2.73	.82	2.92	.86	.23
Severity*	3.97	.58	4.02	.58	.36
Vulnerability*	2.26	.61	2.47	.56	.04
Worry*	2.29	.87	2.56	.83	.07
Prevention*	2.79	1.10	2.82	.90	.91
Coping*	3.06	.93	2.94	.95	.46
Knowledge [†]	5.14	1.80	4.07	1.46	.001

* Fear of infertility, perceived severity of infertility, perceived vulnerability to infertility, worry about infertility, prevention efficacy, and coping efficacy scores ranged from 1 to 5, with higher scores indicating a greater degree of those variables.

[†] Knowledge of infertility scores ranged from 0 to 11, with higher scores indicating more knowledge of infertility

Examining the stated hypotheses, a series of 2 (alarm; high, low) x 2(dosage of articles; 1, 2) ANOVAS are reported below. There was not a significant main effect of alarm on fear of infertility, $F(1, 127) = 1.48, p = .227$, perceived severity of infertility, $F(1, 127) = .838, p = .362$, prevention efficacy, $F(1, 127) = .013, p = .909$, or coping efficacy, $F(1, 127) = .543, p = .463$. There was a marginally significant main effect of alarm on worry about infertility, $F(1, 127) = 3.226, p = .075$, with high alarm articles ($M = 2.6$) producing slightly higher levels of worry than low alarm articles ($M = 2.3$). There was also a significant main effect of alarm on perceived vulnerability to infertility, $F(1, 127) = 4.248, p = .04$, with high alarm articles ($M = 2.5$) producing slightly higher levels of perceived vulnerability than low alarm articles ($M = 2.3$). Finally, there was also a significant main effect of alarm on knowledge of infertility $F(1, 112) = 12.705, p = .001$, however, for this dependent variable, low alarm articles ($M = 5.1$) produced higher levels of knowledge about infertility than high alarm articles ($M = 4.1$).

There was no interaction effect of dosage and alarm on any of the dependent variables, indicating that the number of articles did not compound the alarm effect. There was no main effect of dosage on any of the dependent variables with the exception of an unanticipated significant main effect of dosage on perceived severity of infertility, $F(1, 127) = 4.053, p = .046$, with a single article ($M = 3.95, SD = .837$) producing higher perceived severity of infertility than two articles ($M = 3.64, SD = .987$), regardless of alarm level.

4.3 Discussion

The experiment demonstrated that print news portrayals of infertility using high alarm framing strategies may induce higher worry about infertility and heightened levels of perceived personal vulnerability to infertility, while failing to increase pertinent knowledge about infertility, or enhancing individuals capacity to prevent or cope with infertility. This

demonstrates that print news framing infertility in this particular way has repercussions for individual consumers of this news.

Advocates of high alarm framing of infertility in the media may argue that high alarm articles are necessary to bring attention to or raise awareness about the issue of infertility. Indeed, the high alarm groups experienced more perceived vulnerability to and marginally more worry about infertility than did the low alarm groups. Thus, these articles may have raised awareness for the participants about their chance of experiencing infertility which, from an awareness advocate's perspective, may be the first step in individuals preventing or being prepared for dealing with infertility. However, the results also indicated that participants in the high alarm group did not experience significantly any more prevention or coping efficacy than did those in the low alarm condition. Thus, the high alarm articles were no more successful in empowering individuals to prevent infertility or to cope with infertility should they experience it.

Likewise, advocates of high alarm framing of infertility in the media may argue that high alarm articles are necessary to educate individuals about infertility. However, the results of this study demonstrate that participants who read low alarm articles exhibited higher knowledge about infertility than did those who read high alarm articles. This suggests that low alarm articles may, in fact, promote more knowledge about infertility than do high alarm articles. These findings align somewhat with persuasion theory regarding fear inducing messages. Persuasion theory suggests that fear-inducing messages in health communication will be unsuccessful at attitude or behaviour change unless specific recommendations are provided for how to reduce the fear (i.e. how to cope with the threat) (Becker & Josephs, 1988). Given that none of coping efficacy, prevention efficacy, or knowledge increased in the high alarm condition, the participants may not have been adequately provided information about infertility or

recommendations for coping. Thus, they viewed their vulnerability to infertility as higher, but were left with little knowledge about and few ways to cope with infertility.

The results of this experiment somewhat align with those found in studies of alarm frames in news regarding the H1N1 flue virus (Chang, 2012). Chang found that high alarm frames evoked greater fear, perceived severity, perceived vulnerability, but no greater prevention or treatment efficacy than did low alarm articles. Although the current study found no higher fear or severity, the other results were replicated. It is particularly interesting to note that in neither case did the high alarm health news increase prevention or treatment efficacy.

Cumulatively this trend in health news is disheartening as it may lead to fatalistic beliefs about health issues (Niederdeppe, et al., 2010). As noted in the literature review, journalists are guided by a series of interrelated factors when selecting or creating (often subconsciously) frames for their stories. And, they too are individuals who are influenced by the dominant values of society and the way health conditions have been socially constructed; they themselves are members of the public. However, given the influence that media have over the dominant understanding of issues, it is of utmost importance that they respect that power, and always report as responsibly as possible, examining their own biases as they do so. That being said, the responsibility for the issue also lies with the public. In order to promote truly informed health decision-making, it is important that the public engage in critical thinking when reading news reports on health issues.

It is important to note some limitations of this study. First of all, the framing effects that were found were not particularly large. That being said, they were established after participants read only 1 or 2 news articles. Considering the amount of news coverage and other media individuals are exposed to over time, it is really rather striking that a single article may affect

their interpretation of and reaction to an issue, even to a small degree. Secondly, another potential limitation is that the amount of news coverage with regards to infertility any individual had previously is unknown and thus if it was distributed equally among groups is unknown. However, participants were randomly assigned to experiment and control groups and theoretically this should create groups that are equal on demographic characteristics such as previous exposure to infertility news. Third, the duration of the framing effects is unknown as they were measured immediately post-manipulation. Although this is a common criticism of framing studies it is interesting to note that the few framing studies that have measured duration of effects have found that they are surprisingly persistent, lasting up to two weeks past the initial frame exposure (Lecheler, & de Vreese, 2011).

It is curious that there was an unanticipated significant main effect of dosage on perceived severity of infertility with a single article producing higher perceived severity of infertility than two articles regardless of alarm level. Given that which article participants in the 1 article condition read was totally randomized and that the articles in the 1-article condition were the same as those in the 2-article condition, there is no reason to believe this finding was due to the nature of the articles themselves and as such could only be a dosage effect. Why a single article would produce more perceived severity of infertility than two is an interesting question. One potential explanation could be a type of inoculation effect. That is, a single article could produce perceived severity of infertility, but also inoculate the reader to the effects of a second article. One article could prime perceived severity but protect the reader against the effects of further articles.

It is important to remember that information effects are independent from framing effects. That is, information effects are the results of the factual information in the news story, while

framing effects are results of the way that information is presented. As this study had a goal of maximizing external validity and, as such, used real news articles, rather than lab-created articles with identical information but different frames, it is technically impossible to differentiate the framing effects from the information effects in this experiment. However, there is no reason to believe that the articles contained information that was contrary, factually, from each other. Finally, although external validity was maximized by using real-world news articles, it was somewhat compromised by using the laboratory (classroom) setting and some studies have found that media effects studies produce larger effects in the laboratory than in field experiments (Jerit, Barabas, & Clifford, 2013).

The experimental approach in this study has both strengths and weaknesses. An experimental design with random assignment of participants to conditions facilitates high internal validity and allows us to have more confidence that it was indeed the manipulation of the independent variables (high or low alarm) that produced the changes in the dependent variables. However, with any design there is often a tradeoff between internal and external validity. That is, as this study was highly controlled and conducted in a quiet University classroom, the extent to which these results would be replicated when individuals are reading the news of their own volition is left unknown. Likewise, it is important to note that readers are not a homogenous group and that readers in their day-to-day life might not read news in the focused manner they did in this laboratory study. In day-to-day, certain readers may have more interest in certain news because it either contradicts or aligns with their own beliefs. For instance, theoretical tenets of confirmation bias theory suggest that people are more likely to seek out and interpret evidence in ways that align with existing beliefs and expectations (Nickerson, 1998). Thus, the extent to which a variety of types of readers would read news articles about infertility in their day-to-day

lives and thus be affected by this news is unknown. However, that this study design used real news articles for the manipulation of the independent variables increases the external validity of the study by making the results applicable to real world published news.

Another a potential limitation of the study is the measures it employed. The measures were adapted from previously validated measures; however, their validity in this context has not been established. Future studies could seek to establish the validity of these measures. Finally, as evidenced by a relatively low alpha coefficient, (.643) perceived severity scale demonstrated relatively low internal consistency reliability for this sample, and thus may not be an optimal measure of this construct for this sample, and may have contributed to the non-significant differences between groups on that variable. Low internal consistency reliability suggests that the items may not be measuring a unified construct, and also has repercussions for the power of statistical tests. The less reliable a measure, the more error it contributes to a statistical analysis and in turn the less likely the analysis is to detect a significant difference between groups (DeVellis, 2012).

Cumulatively the results of this study extend the findings in Study 1 regarding the social construction of infertility in media. Study 1 concluded that the framing of infertility as alarming is pervasive in Canadian print news. Study 2 extends these findings by demonstrating the potential negative effects of this construction paired with the lack of positive effects on consumers of this news. That is, print news portrayal of infertility using high alarm framing strategies may induce higher worry about infertility and heightened levels of perceived personal vulnerability to infertility, while neglecting to relay pertinent knowledge about infertility, or enhancing individuals capacity to prevent or cope with infertility. Given the negative effects of the high alarm framing of infertility and the lack of educative or empowering effects, the

perpetuation of this construction in the news should be questioned.

CHAPTER 5

GENERAL DISCUSSION AND CONCLUSION

This thesis makes two main contributions. First, it contributes to the understanding of the social construction of infertility and one of the social mechanisms that serve to perpetuate that construction, the media. Second, it contributes to the understanding of media effects, extending the literature on framing, and framing effects to demonstrate yet another social issue for which the media have the ability to shape our understanding. In Study 1, the content analysis suggested that news media perpetuate a definition of infertility that constructs infertility as a serious, a prevalent, and predominantly a women's *disease*, for which high levels of external coping are possible through medical intervention. The content analysis also revealed the news media construct infertility as a problem for which the cause is delayed childbearing, and the solution is in vitro fertilization. In Study 2, the experiment suggested that print news portrayals of infertility using high alarm framing strategies may induce higher worry about infertility and heightened levels of perceived personal vulnerability to infertility, while neglecting to relay pertinent knowledge about infertility, or enhancing individuals capacity to prevent or cope with infertility. This demonstrates that print news framing infertility in this particular way has repercussions for individual consumers of this news, and therefore also the public's understanding of and reaction to infertility.

Infertility is a complex experience with a physical etiology, but social and psychological implications for individuals, families, and societies. The biomedical construction of infertility as a physical disease has been pervasive in society for at least two decades. Previous research has demonstrated that the biomedical construction has a limited ability to reflect the experiences of those diagnosed with infertility, and that it often includes women who, although technically infertile by the medical definition, do not identify with the label nor sometimes even desire

children. Social scientists have suggested that a social/psychological construction, which puts more emphasis on the nuances of involuntary and voluntary childlessness, would be more applicable to the lived experience of these individuals.

Although academic work has more and more reflected this more nuanced construction of infertility, the first study in this thesis found that Canadian print news still adheres primarily to a medicalized, highly alarmist, construction of infertility as a women's disease, for which coping is primarily available through biomedical intervention such as in vitro fertilization. The second study in this thesis found that this construction has repercussions for consumers of print news in terms of higher perceived vulnerability to and worry about infertility, with no higher knowledge about, or perceived efficacy to deal with infertility. Previous research had demonstrated that the media have the power to influence what the public thinks about (agenda-setting) and how they think about it (framing). This has been established in variety of types of news, but these are the first studies to demonstrate framing effects from infertility news.

Journalists, medical and health practitioners, and the general public can benefit from this research. Journalists may garner the importance of careful reporting of events and experiences, knowing that there is no truly essential way health issues are experienced, and thus no essential way they need to be reported. For medical and health practitioners, these studies can draw their attention to the common understanding of experiences that patients have been exposed to by the media, and perhaps draw their attention to alternative ways to think about conditions they have previously essentialized as solely medical. Finally, for the public, these studies can highlight the importance of being a critical news consumer. Although the public relies on the media for information about current events, the public must proceed with caution when interpreting news reports, not accepting news at face value, and understanding that any report is inescapably

shaped by journalists themselves, political, economic, and corporate forces, and dominant (but not necessarily the most widely beneficial) social values.

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APPENDIX A
CONSENT FORM

Consent Form

Effects of News Articles on News Consumers

Participant Pool Study Code: Y12 Behavioral Research Ethics Code: BE 13-352



You are invited to participate in a research study entitled *Effects of News Articles on News Consumers*. Please read this form carefully, and feel free to ask any questions you might have about the study by contacting the researchers using the information below. Please print off a copy of this form for your records.

Student-Researchers: Sarah Sangster, Department of Psychology, 306-966-6159, sarah.sangster@usask.ca.

Supervisor: Karen Lawson, Department of Psychology, 306-966-2524, karen.lawson@usask.ca.

Purpose and Objectives: The purpose of this study is to investigate the effects of reading news articles on a variety of emotions towards and knowledge of the issue reported in the article.

Procedures: If you decide to participate, you will be asked to read a series of news articles then complete a pencil and paper survey that includes a number of measures to examine your feelings regarding infertility. Although the survey is completely anonymous, please feel free to leave unanswered any questions that make you feel uncomfortable. The estimated time of completion for this study is 30 minutes. After reading the consent form, if you decide you would like to participate, you will be provided some news articles to read. You should read those carefully as the following survey will include questions about the articles. After reading the articles you will be provided the survey. Please respond to the survey questions thoughtfully and thoroughly. Upon completing the survey you will be debriefed. Following debriefing, you will have the option of submitting or withdrawing your survey.

Risks: There are no known risks associated with participation in this study. Furthermore, you may receive no personal benefits from participation in the study. At the end of the study you will be provided a debriefing form that better explains the nature of the study. You may contact the researchers by email should you have any questions or concerns. You may also contact the University of Saskatchewan's Student Health and Counselling Services (966-5768) should you become upset as a result of participating in this study.

Compensation: If you decide to participate, you will be awarded 1 credit towards your Psychology 110 bonus marks for research study participation.

Confidentiality: Your information is anonymous. We will not ask you for any identifying information. Although the responses are anonymous, participation in a group setting has limitations to confidentiality that we as researchers can guarantee. That is, others in the group will be aware that you participated in this study. That being said, we ask that when you leave the study you please respect the confidentiality of other participants and not report to anyone who has participated in the study. Your responses will only be used as part of a larger dataset. All the data from the survey will be securely stored for five years and then it will be destroyed beyond recovery. The data may be published in an academic journal and/or presented at a professional conference. When the data is no longer required, it will be destroyed beyond recovery.

Right to withdraw: You may withdraw from the study for any reason, at any time prior to submitting the data, without penalty of any sort and/or without loss of a research credit. If you wish to withdraw from the study simply leave the study room without completing the survey. However, due to the anonymous nature of the database, you will not be able to withdraw after you have submitted your data because of the inability to identify the data of any specific individual.

Questions: If you have any questions concerning the study, please feel free to ask at any point by contacting the researchers by email. You are also free to contact the researchers at the numbers provided above if you have questions at a later time. The proposed research was reviewed on ethical grounds by the Behavioural Research Ethics Board. Any questions regarding your rights as a participant may be addressed to the Research Ethics Office (ethics.office@usask.ca; toll free at 1-888-966-2975). Out of town participants may call collect. You may obtain a copy of the results of the study by contacting the student-researcher or the supervisor.

At the end of our study (April 2014), we will make a summary of the results available on our reproductive psychology research team website: www.reproductivepsy.usask.ca. You may also choose to contact the researchers by email for a summary of the results.

Consent to Participate: I have read and understand the description of the research study provided above. I have been provided with an opportunity to ask questions and my questions have been answered satisfactorily. I agree to participate in the study described above, understanding that I may withdraw my consent to participate at any time prior to submitting my data. A description of the study and contact information will be given to me for my records.

By completing and submitting the questionnaire, **YOUR FREE AND INFORMED CONSENT IS IMPLIED** and indicates that you understand the above conditions of participation in this study.

A copy of this consent will be left with you, and a copy will be taken by the researcher.

APPENDIX B
DEBRIEFING FORM

Debriefing



Effects of News Articles on News Consumers

Participant Pool Study Code: Y12 Behavioral Research Ethics Code: BE 13-352

Thank you for your participation in this study! Your participation is sincerely appreciated, and we hope that you have found your experience to be interesting. As noted in the consent form provided to you at the beginning of the survey, the purpose of this study is to investigate the effects of reading news articles on a variety of emotions towards and knowledge of the issue reported in the article. Specifically, we were examining if exposure to news articles on infertility high in alarm would affect readers differently than would exposure to news articles on infertility low in alarm.

We could not reveal the full purpose or design of the experiment to you at the beginning of this study because we did not want to influence your responses on the survey. There were four groups in this study and you were randomly assigned to one of these four groups: 1) those who read one news article on infertility high in alarm, 2) those who read three news article on infertility high in alarm, 3) those who read one news article on infertility low in alarm, and 4) Those who read three articles on infertility low in alarm. This design enables us to determine the effects of the high alarm news articles compared to the low alarm news articles (the different frames) and lets us see if exposure to more news articles high or low in alarm have cumulative effects on the reader. Our hypotheses were:

1. Exposure to news articles on infertility with high alarm frames as opposed to low alarm frames will evoke (a) greater levels of fear, (b) higher severity ratings, (c) higher vulnerability ratings, (c) higher worry about infertility, but (d) no higher perceived efficacy nor (f) more knowledge about infertility.
2. Exposure to more news articles on infertility will increase (a) greater levels of fear, (b) higher severity ratings, (c) higher vulnerability ratings, (c) higher worry about infertility, but (d) not perceived efficacy nor (f) more knowledge about infertility.

Please note that we as researchers do not endorse a view of infertility as either high or low in alarm. Our purposes were only to understand the effects of these different frames on people who read that news. That being said, it is important to us that as a result of the study you are aware of

both the established and debated facts regarding infertility. To this end, we would suggest four research articles that may provide different perspectives of the rates and pervasiveness of infertility. Those are:

Bushnik, T., Cook, J. L., Yuzpe, A. A., Tough, S., & Collins, J. (2012). Estimating the prevalence of infertility in Canada. *Human Reproduction*, 27, 738-746.
doi: 10.1093/humrep/der465

Dunson D. B., Columbo, B., & Baird D. D. (2002). Changes with age in the level and duration of fertility in the menstrual cycle. *Human Reproduction*, 17(5), 1399–1403.

Herbert, D. L., Lucke, J. C., & Dobson, A.J. (2012). Birth outcomes after spontaneous or assisted conception among infertile Australian women aged 28 to 36 years: a prospective, population-based study. *Fertility and Sterility*, 97(3), 630-638
doi:10.1016/j.fertnstert.2011.12.033

Marchbanks, P. A., Peterson, H. B., Rubin, G. L., Wingo, P. A., & The Cancer and Steroid Hormone Study Group. (1989). Research on infertility: Definition makes a difference. *American Journal of Epidemiology*, 130(2), 259-267.

The results of this study will be posted on our reproductive psychology research team website (www.reproductivepsy.usask.ca) at the end of the study (April 2014). You may also choose to contact the researchers by email for a summary of the results.

Any questions regarding your rights as a participant may be addressed to the Research Ethics Office (ethics.office@usask.ca; 966-2084). Out of town participants may call collect. Should you become upset as a result of participating in this study, you may contact the University of Saskatchewan's Student Health and Counselling Services (966-5768).

Researchers: Sarah Sangster (sarah.sangster@usask.ca; 306-966-6159), Applied Social Psychology masters student, supervised by Dr. Karen Lawson (karen.lawson@usask.ca; 306-966-2524), Department of Psychology, University of Saskatchewan.

APPENDIX C HIGH ALARM STIMULI ARTICLES

The Daily

18 SEP 2013

Canada's infertility rates rising Growing number of young women have trouble conceiving, study finds

By AUTHOR

Infertility is on the rise in Canada, according to the first study in nearly two decades to measure the proportion of Canadian couples who are having difficulty conceiving.

The researchers didn't set out to discover why the numbers are increasing. But possible explanations range from the growing number of women who are pushing back pregnancy over later in life, to rising rates of obesity and heavy drinking among women, to declining sperm counts in men - though experts aren't convinced about that final factor.

The use of assisted-procreation technologies has increased dramatically over the past decade, yet "little is known about the prevalence of infertility in the population," the authors write in the journal, *Human Reproduction*.

The research was supported by funding from Assisted Human Reproduction Canada, a federal agency. The lead author is from Statistics Canada.

According to their estimates, up to 16 per cent of heterosexual couples where the woman is age 18 to 44 are experiencing infertility - a near doubling since the previous time infertility was measured in the nation in 1992.

Not surprisingly, the older the woman, the higher the prevalence of infertility.

Yet infertility appears to be rising among younger women as well, the study finds.

In 1984, about five per cent of couples with a female partner age 18 to 29 were infertile.

By 2009-10, the prevalence for the same age group ranged from seven to 13.7 per cent.

For their analysis, researchers used data from a sample of 4,412 couples from the 2009-2010 Canadian Community Health Survey.

Infertility ranged from 11.5 per cent, to 15.7 per cent.

Those estimates are based on whether couples had reported becoming pregnant or not in the past 12 months, were not using any form of birth control within the past 12 months while having sexual intercourse, and had tried to become pregnant with their current partner. Regardless of how it was defined, each estimate represented an increase in infertility when compared with previous national estimates, said first author Tracey Bushnik, a senior analyst at Statistics Canada.

In 1992, 8.5 per cent of women age 18 to 44 who were married or living common-law were considered infertile.

In 1984, the figure was 5.4 per cent.

Not only are the emotional, physical and financial costs to couples substantial, the researchers write, but the health system also has to bear the costs of caring for premature babies or multiple births born from assisted reproductive technology.

The new study "just confirms everything we've been gnawing on for the last little while," said Dr. Roger Pierson, a world leader in research into ovarian physiology at the University of Saskatchewan.

Canada's pregnancy specialists have been sounding an alarm over the risks of deferred motherhood. The Society of Obstetricians and Gynaecologists of Canada - which has just issued new guidelines to doctors on

"advanced reproductive age" and fertility - worries that women are placing too much blind faith in high-tech fertility treatments to help them conceive once they're ready to have a baby.

For women over 40, the failure rate approaches 90 per cent.

"We're not miracle workers," said Dr. Al Yuzpe, co-author of the new study and co-founder of the Genesis Fertility Centre in Vancouver, one of the largest in-vitro-fertilization clinics in the country.

The other authors of the report were Jocelynn L. Cook, of the Department of Obstetrics and Gynaecology at the University of Ottawa; Suzanne Tough, of the Departments of Pediatrics and Community Health Sciences at the University of Calgary; and John Collins, of the Department of Obstetrics and Gynaecology at McMaster University in Hamilton, Ont.

"We know that there's a precipitous drop in conception rates as women get older," Yuzpe said.

In addition to the well-documented impact of age, other factors affecting female fertility include obesity, alcohol use and sexually transmitted infections.

While fewer women are smoking, more younger women are boozing heavily reported rates of heavy drinking - defined as five or more drinks at a time at least once a month - among women age 20 to 34 increased from nine per cent in 1994, to 20 per cent in 2010.

Reported rates of chlamydia and gonorrhea are also rising, with the majority of infections reported for women under 30.

And obesity rates are climbing. In 2007-09, 21 per cent of women ages 20 to 39 in Canada were obese, up from four per cent in 1981. Obesity can interfere with a woman's normal ovarian function.

Obese men, meanwhile, have been found to have lower volumes of semen and a higher proportion of abnormal sperm. But just how much of a role

sperm count deterioration may have on declining fertility is controversial.

Yuzpe said the data are not convincing.

"The question keeps coming up: Are men's sperm counts getting worse?" he said. "There might be a slight overall reduction in sperm counts, but not from 'normal' to 'abnormal' sort of thing."

Yuzpe said people are much more likely today to report difficulty conceiving than they would have been in the past, "because of the stigma associated with it," but also because people didn't seek help "because there wasn't much we could do for them."

"It's only in the last 35 or 40 years that we've had anything of any significance that we could do for women, or for couples," he said.

Pierson said the study raises important individual and societal questions, including, "When is the right time to have a child?"

"If we were to suddenly stop ART assisted reproductive technology and say, 'We're going to support women having children in their early 20s,' I would say that most of the infertility issue would go away."

"That's not our cultural reality. We have to come to a better understanding of our biological imperatives, and our social expectations."

International Moose Count Underway

By BOB O'BOBOSTON

The UN-sponsored International Moose Census got off to a flying start today with hopes for an increase in the worldwide moose population compared to last year's disappointing figures. Among the traditional early reporters were Egypt, returning figures of six moose, a twenty percent increase on 2011's figures of five, and Uruguay whose moose population remains stable at eleven.

According to Robbie McRobson, head of the UN Moose Preservation Council, worldwide moose numbers are expected to grow markedly

on last year due to the traditional moose strongholds of Canada and the United States, with the larger developing moose ecologies also poised to make gains. The largest percentage increase in moose will likely come from China", says McRobson. The Chinese government has invested heavily in moose infrastructure over the past decade, and their commitment to macrofauna is beginning to pay dividends. Since 2004 China has expanded moose pasture from 1.5 of arable land to nearly 3,648 and moose numbers are expected to rise to 60,000 making China a net moose exporter for the first time. This is good news for neighbouring Mongolia, a barren moose-wasteland whose inhabitants nonetheless have an insatiable desire for the creatures. The increase in Beijing-Ulanbataar trade is anticipated to relieve pressure on the relatively strained Russian suppliers, but increase Mongolia's imbalance of trade with its larger neighbour.

Historically the only competitor to China in the far eastern moose markets has been Singapore but the tiny island nation is set to report a net loss, expecting a decrease of more than five percent on last year's 50,000 moose counted. The head of Singapore's Agency for Agriculture, Jing-Feng Lau, explained to an incredulous Singaporean parliament yesterday that bad weather had contributed to this season's poor showing, most notably when a cargo of 150 moose were swept out into the Indian ocean in a monsoon.

Yet again the global demand for moose will be met largely by the US and Canada. The recession-hit States is taking comfort in its moose growth figures with gross production expected to break 700,000 and net exports to grow by 2. The worldwide dominance of Canada shows no signs of abating though with this year's moose population expected to match last year's record figures of one hundred million billion.

Europe's rise as an international moose power will slow slightly this year as a response to the European Union's move towards standardising the European moose. Stringent quality controls are holding back the development of the eastern European

populations compared to last year when they contributed significantly to Europe's strong growth figures. Norway, which is not an EU member but has observer status, strengthened in numbers relative to the Euro area with numbers of Norwegian moose, known locally as *elk* expected to rise for the tenth consecutive year, particularly thanks to a strong showing in the last quarter.

As moose season reaches its close, researchers world wide are turning to science in an attempt to boost next year's figures. NASA stunned the scientific community today with the announcement of their discovery that the moon is significantly smaller than previously believed. This conclusion, which is the conclusion of a ten-year collaborative project, will have profound implications for the moose community as the gravitational field is now known to be of the right strength to support moose in orbit.

According to John Johnson, head of the NASA Moon Sizing Experiment the first delivery of moose into low moon orbit could be achieved as early as the third quarter of next year. The technology to nurture moose in space is available now", he said, "all that is needed is political will".

Granny wins World Wrestling Championship

By ROY MCROYSTON

Records were smashed in Nicaragua's World Wrestling Championship last night as 78-year-old Maud Johnson, grandmother of five, became the first woman for fifty-six years, and the oldest competitor ever, to claim the gold medal. She walked away with her million dollar share of the prize money, runner up Tommy Thompson from Nigeria taking half a million, and third place New Zealander John Smith receiving a warm handshake from the umpire.

Having started the tournament a rank outsider she began to impress in her second match when she took

The Daily

18 SEP 2013

Unique IVF plan born in Quebec Publicly funded clinic slows 'epidemic' of twins, triplets

By AUTHOR

FIVE-STAGES OF IVF TREATMENT

In vitro fertilization is among a number of assisted reproductive technologies, including artificial insemination, and pre-implantation genetic diagnosis, which involves selecting embryos that are free of chromosomal defects for transfer to the uterus.

IVF follows five main steps

Step 1 The patient is given hormone injections to stimulate her ovaries - a process that can last two to five weeks. The purpose of the stimulation is to "ripen" a woman's eggs and increase the likelihood of collecting several eggs during one of the woman's cycles.

Step 2 Eggs are retrieved through a minor surgical procedure called follicular aspiration by inserting a hollow needle through the pelvic cavity.

Step 3 Sperm, either obtained from a spouse or a donor, is prepared prior to fertilization.

Step 4 The eggs and sperm are placed in incubators in the lab in a delicate process called insemination. In some cases, the embryologist will inject a single sperm directly into the egg in a procedure called intracytoplasmic sperm injection.

Once an egg is fertilized and cell division starts taking place, an embryo is created.

Step 5 One to six days later, the embryo or embryos are suspended in fluid and transferred into a woman's uterus. Medication is taken to help

with the implantation. A pregnancy test is later carried out to verify whether the embryo has been implanted in the uterus.

Postmedia News

Felicia Cristina Cojani and her husband had been trying to conceive a child for three years before nearly giving up in frustration and heartache.

She was 35 years old and in robust health when she first found out she was pregnant. But her joy at the prospect of starting a family soon gave way to despair after learning her pregnancy was ectopic, with the fetus growing outside her uterus.

She became pregnant two more times, and miscarried each time, and by then she was 38, knowing that her chances of giving birth were dwindling with each passing year.

"It was like I was in mourning," Cojani said of her miscarriages. "It was very difficult, both physically and psychologically. We were losing hope."

That's when Cojani, an immigrant from Romania who works as a nurse's aide, learned of Quebec's new program of government-funded in vitro fertilization IVF, a treatment that used to cost tens of thousands of dollars.

She booked an appointment with the McGill Reproductive Centre and met with the medical director, Hanael Holzer, in October 2010 - two months after the government program was launched.

Although he made no promises, Holzer told her she was a candidate for IVF. She became pregnant after her first IVF treatment in January 2011, but six weeks into the pregnancy she lost the baby. Holzer carried out more tests and discovered a polyp in her uterus that was removed surgically. Still, the second IVF attempt failed.

However, the third IVF try with a single embryo was the charm, and on May 11 this year, Cojani, at age 40, gave birth to a girl weighing just

under nine pounds.

"I was never able to really feel happy until the very end, until I had my baby in my arms," she said of her daughter, Karla Elena.

"Dr. Holzer, he's not a person, he's an angel," she added. "And without this program, I would never have been able to afford IVF, and my life would never have been fulfilled 100 per cent."

Cojani is among thousands of Quebecers - many from low-income backgrounds, including single women - who have taken advantage of what is known officially as the Quebec Program of Assisted Procreation - the only one of its kind in North America. Manitoba and Ontario, which used to cover IVF during the 1990s, are closely monitoring the Quebec model before deciding whether to follow suit.

The rationale behind the program was to drastically reduce what some observers have described as an "epidemic of twins and triplets" since the first test-tube baby, Louise Brown, was born in England in 1978. And on that score, Quebec has succeeded beyond all expectations, experts say, slashing the rate of multiple pregnancies from 30 per cent in 2009 to 7.9 per this year.

No other country that funds IVF, including Sweden, Belgium and Denmark, has achieved such results in so short a span of time, said Veronique Robert, editor of *Creating Families* magazine.

"The reduction in multiples is absolutely incredible, and it hasn't been emphasized enough that Quebec is now in the forefront in the world for the low rate of multiple births," Robert said.

Previously, couples had to pay for IVF and often demanded that fertility doctors transfer as many as four embryos to the uterus of a woman to boost her chances of getting pregnant. This led to a boom in twins and triplets.

Under the government program,

however, only single transfers of embryos are covered, with few exceptions. This requirement has revolutionized the way fertility medicine is practised in Quebec, as physicians are no longer under pressure to transfer multiple embryos against their better clinical judgment.

"For years, the mission of fertility doctors was to reduce the number of multiples," said Holzer, of the McGill Reproductive Centre, explaining that many twins and triplets are born prematurely and are in urgent need of neonatal intensive care.

"For years, there were efforts to increase the use of elective single embryo transfers, but in 2009 only 1.6 per cent of IVF transfers in Quebec were elective single embryos.

Yet within a few months of changing the regulations in Quebec, it went up to almost 60 per cent."

Despite the success in curbing multiple pregnancies, Quebec's program is going through some sharp growing pains - including an unexpected jump in costs, as well as ethical controversies revolving around decisions on whether to approve IVF for women who might be psychologically unstable.

The program has also provoked bitter feuding between public and private fertility clinics, with both sides accusing each other of manipulating their success rates to curry favour with the government. The operators of private clinics, in particular, feel let down by the government for initially turning to them for support in getting the program started, only to devote more resources later to the public centres.

Yet staff at the public and private clinics agree that covering IVF under medicare was a good idea.

"I love that we have a diverse sampling of patients," said Dr. Janet Takefman, director of psychological services at the McGill centre.

"You know, treating the elite never sat well with me. Before, it was those who could afford it had children and those who couldn't didn't. I think it's a wonderful opportunity that anybody can use these technologies right now."

Takefman is also relieved that she rarely provides psychological coun-

selling to women who are pregnant with twins or triplets as a result of the IVF transfer of several embryos, and who might be considering the wrenching decision of "multi-fetal reduction" - aborting one or two fetuses. That dark side of assisted reproductive technologies was seldom discussed publicly before the government program.

Still, Takefman and other psychologists are confronted with more couples than before who haven't educated themselves about all the pros and cons of IVF, as well as women who might not be prepared psychologically for the responsibility of raising a child. The sheer increase in the IVF caseload - at the McGill centre it has more than doubled - has put a greater strain on counselling resources. Dr. Jacques Kadoch, chief of reproductive medicine at the Centre hospitalier de l'université de Montréal, said he didn't expect that he would truly need the services of a psychologist or social worker when he inaugurated his public clinic in December 2011.

But Kadoch makes it a policy of meeting monthly with his clinic's psychologist, as well as a medical ethicist, to ponder the more difficult cases. He noted that this year he had to obtain a legal opinion before rejecting an IVF request from an HIV-infected woman who has children in Africa and who wanted to get pregnant with sperm from an anonymous donor.

"Does she have the parental capacity?" he asked. "Can we say yes to her or no to her? Do we even have the right to say yes or the right to say no? These are decisions that are too weighty for the doctor to take all alone, and these are situations that we did not have before."

Quebec initially projected that the program would cost \$64 million over five years. However, documents obtained by The Montreal Gazette reveal that the government has revised those projections to more than \$123 million - and those figures don't include the fees paid for IVF procedures in Montreal's four private clinics.

A cost-benefit analysis by health economist Lindy Forte predicts that during the first five years of the pro-

gram, the cumulative savings in lower neonatal costs will reach \$282 million. Three years ago, neonatal intensive-care wards were filled to 140-per-cent capacity. Today, those same wards don't exceed their capacity.

Robert insisted that it's the patient outcomes that count most, with fewer high-risk multiple pregnancies and fewer pre-term babies born with cerebral palsy and other anomalies.

International Moose Count Underway

By BOB O'BONSTON

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APPENDIX D

LOW ALARM STIMULI ARTICLES

The Daily

18 SEP 2013

Women struggling to become pregnant should keep trying, study suggests

By AUTHOR

Almost half of women who said they'd been struggling to get pregnant for at least a year ended up having a baby despite not getting fertility treatment, in a new study from Australia.

That success rate was only slightly lower than in women who also reported trouble conceiving and opted for treatment with fertility hormones or in vitro fertilization.

"Many women aged up to 36 years with a history of infertility can achieve spontaneous conception and live birth without using fertility treatment indicating they are sub-fertile rather than infertile," said study researcher Danielle Herbert of the University of Queensland School of Population Health in Brisbane.

That means that if nothing is clearly wrong - men make enough sperm, and women are ovulating regularly - couples who have had trouble conceiving should still be optimistic they can get pregnant on their own, researchers said.

"I'm not surprised that women who were not treated still got pregnant - we know that," said Courtney Lynch, head of reproductive epidemiology at The Ohio State University in Columbus, who was not involved in the new research.

"We know we can get women pregnant quicker if we have them go into IVF, but if we give women time, many of them can still get pregnant," Dr. Lynch said.

The research is part of a long-term study of more than 7,000 women liv-

ing in Australia. Starting in 1996, participants filled out health surveys every few years, which included questions on pregnancy and childbirth.

The current data is from about 1,400 women age 28 to 36 who reported on the most recent questionnaires that they'd tried unsuccessfully to get pregnant for at least a year at a time. Close to 600 of those women said they'd received infertility treatment using IVF or fertility hormones.

Through the latest survey in 2009, 53 per cent of those women said they had a baby following fertility treatment, compared to 44 per cent of women who'd had trouble conceiving but didn't seek treatment, the researchers reported in the journal *Fertility and Sterility*.

For women who did have a baby, there was no difference in pregnancy complications - including stillbirths or premature births - between those who did and didn't get fertility treatment.

Dr. Herbert and her colleagues pointed out some limitations of the report, including that they didn't know if women changed male partners at any point during the study period, which could have affected their chances of becoming pregnant.

And one fertility researcher not involved in the new study said it's impossible to know whether women who didn't get treatment lost or gained weight, or changed their diet and lifestyle to improve their chances of conceiving.

Alice Domar, of Boston IVF, said that the number of women who got pregnant without treatment after a year of infertility is higher than previous studies suggested.

"What a lot of physicians feel is if you're not pregnant within a year, it usually means there's something going on," she said.

Dr. Domar said that she'd still recommend that a woman who's been trying to get pregnant for that long get checked out to see if there's any-

thing preventing conception. If not, she can keep trying. But if, for example, her tubes are blocked, any extra waiting is "time out the window," she said.

Dr. Lynch said that about 15 per cent of women won't get pregnant after a year of trying, but only 3 to 5 per cent of them are truly infertile. The rest will likely conceive on their own after another year or two.

"There are a lot of patients that don't want to wait another year, especially if you're an older patient," Dr. Lynch said - and they might want fertility treatment, even if pregnancy without it may be possible. "But if you're 28, I think waiting another year makes sense potentially before going on a treatment."

According to Dr. Domar, most women who can't get pregnant will only need treatment with fertility hormones, which cost about a dollar a day, to get ovulation back to normal. IVF, on the other hand, runs for about \$15,000 U.S. a cycle, and may or may not be covered by insurance.

The findings can be seen as encouraging for some women, Dr. Domar said. "It means if you've been trying for a year and you're young and you have unexplained infertility, according to this data you have a decent chance of spontaneously conceiving."

International Moose Count Underway

By BOB O'BOBOSTON

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The Daily

10 OCT 2013

The 300-year-old fertility statistics still in use today

By AUTHOR

Most women over the age of 25 will be familiar with those concerned looks from older relatives followed up by a whispered "Isn't it about time you started thinking of having a baby?" But what if much of what we have been led to believe about the impact of age on fertility is not true? Take this often-cited statistic one out of three women over the age of 35 will not have conceived after a year of trying.

Jean Twenge, a psychologist at San Diego State University in the US, was 34, recently remarried, and looking to start a family, when she heard it from her doctor.

"That was very frightening to me, as it is to many women who are in their 30s," she says. Confronted with those odds, she wanted to find out where the statistic had come from. And she discovered something quite amazing.

"The data on which that statistic is based is from 1700s France. They put together all these church birth records and then came up with these statistics about how likely it was someone would get pregnant after certain ages."

These are women who had no access to modern healthcare, nutrition or even electricity. Why would any researcher think they can tell us something useful about modern-day fertility?

Well, actually, they do have one big advantage. They weren't using effective methods of birth control. "I can empathise slightly with the researchers in this area," says Twenge, who traced the source of the data as she researched her book, *An Impatient Woman's Guide to Getting*

Pregnant. "It is difficult to draw conclusions about age and fertility from modern populations where birth control is widely used." But there are some studies which have looked at modern couples, and these do paint a rather different picture.

The most widely cited is a paper by David Dunson published in 2004, which found that 82 of women aged between 35 and 39 fell pregnant within a year. That's significantly better than the two-thirds chance drawn from the 300-year-old birth records.

But can we be confident it's more accurate?

Yes, says David James, of the UK's National Institute for Health and Care Excellence Nice fertility guideline development group.

"It was a single study undertaken relatively recently of about 780 women, in seven different European centres. The important point about that was that these were women who were trying to conceive," he says, adding that it is "much more realistic". The main problem with the historic data, in James's view, is that the women may not have been trying to conceive.

Indeed, they may have been actively trying to avoid becoming pregnant. They may not even have had intercourse.

"There's no doubt that intercourse becomes less frequent the older the couple are," James says. And in the 1700s, people aged more quickly than today.

Another finding of the Dunson study was that, while fertility declines with age, it does not appear to do so as quickly as we have been led to believe.

Among women aged 27-34, the study showed that 86 will have conceived within a year of trying. So the 82 figure for women aged 35 to 39 is only a little lower.

After that, the picture is a little less clear.

"It would appear from the limited

and poor quality data that we have that that rate falls significantly at 40. But as we know from some notable celebrity cases, it is not impossible to get pregnant in the early or indeed late 40s," says James.

And, he adds, there is evidence that female fertility is improving.

The latest update of the Nice guideline on fertility recognises that "the chances of women naturally conceiving at the age of 40 are much higher now than they were when the original guideline was written in 2004," James says.

But what about the risk of chromosomal abnormalities, such as Down's syndrome? It's possible that this has been overstated too, in James's view.

The chance of any chromosomal abnormality at the age of 20 is one in 500, he says.

That increases to one in 400 at the age of 30, and one in 60-70 at age 40.

"Turning that on its head, it does mean that 59 out of 60 women aged 40 will have no chromosomal problems in their baby at all."

So while it's harder for older women to get pregnant, and the chance of a chromosomally abnormal child increases, these problems do not increase as sharply as we fear - except perhaps for those trying IVF or artificial insemination.

"Those statistics are more discouraging for older women," explains Twenge. "The difference in success rates in IVF between your early 30s and your late 30s is a lot bigger than the difference in success in natural conception."

Similarly with artificial insemination - the data shows that the success rates just are not as high as natural conception rates and can differ by as much as 20 percentage points.

But many fertility problems that women over 30 experience have nothing to do with age. Had they tried to conceive in their 20s, they would have also faced difficulties.

"I think that doctors who give

blanket advice to populations are making all sorts of presumptions," says leading fertility expert Prof Lord Winston. "We eventually find out that so much of this advice is spurious and unnecessary and often wrong."

So is there any "blanket" fertility advice he can give?

"The fact of the matter is, the best way to have a baby is either in bed or by the fireside on the hearth rug."

International Moose Count Underway

By BOB O'BOBSTON

The UN-sponsored International Moose Census got off to a flying start today with hopes for an increase in the worldwide moose population compared to last year's disappointing figures. Among the traditional early reporters were Egypt, returning figures of six moose, a twenty percent increase on 2011's figures of five, and Uruguay whose moose population remains stable at eleven.

According to Robbie McRobson, head of the UN Moose Preservation Council, worldwide moose numbers are expected to grow markedly on last year due to the traditional moose strongholds of Canada and the United States, with the larger developing moose ecologies also poised to make gains. The largest percentage increase in moose will likely come from China", says McRobson. The Chinese government has invested heavily in moose infrastructure over the past decade, and their commitment to macrofauna is beginning to pay dividends". Since 2004 China has expanded moose pasture from 1.5 of arable land to nearly 3.648 and moose numbers are expected to rise to 60,000 making China a net moose exporter for the first time. This is good news for neighbouring Mongolia, a barren moose-wasteland whose inhabitants nonetheless have an insatiable desire for the creatures. The increase in Beijing-Ulanbataar trade is anticipated to relieve pressure on the

relatively strained Russian suppliers, but increase Mongolia's imbalance of trade with its larger neighbour.

Historically the only competitor to China in the far eastern moose markets has been Singapore but the tiny island nation is set to report a net loss, expecting a decrease of more than five percent on last year's 50,000 moose counted. The head of Singapore's Agency for Agriculture, Jing-Fong Lau, explained to an incredulous Singaporean parliament yesterday that bad weather had contributed to this season's poor showing, most notably when a cargo of 150 moose were swept out into the Indian ocean in a monsoon.

Yet again the global demand for moose will be met largely by the US and Canada. The recession-hit States is taking comfort in its moose growth figures with gross production expected to break 700,000 and net exports to grow by 2. The worldwide dominance of Canada shows no signs of abating though with this year's moose population expected to match last year's record figures of one hundred million billion.

Europe's rise as an international moose power will slow slightly this year as a response to the European Union's move towards standardising the European moose. Stringent quality controls are holding back the development of the eastern European populations compared to last year when they contributed significantly to Europe's strong growth figures. Norway, which is not an EU member but has observer status, strengthened in numbers relative to the Euro area with numbers of Norwegian moose, known locally as elk" expected to rise for the tenth consecutive year, particularly thanks to a strong showing in the last quarter.

As moose season reaches its close, researchers world wide are turning to science in an attempt to boost next year's figures. NASA stunned the scientific community today with the announcement of their discovery that the moon is significantly smaller than previously believed. This conclusion, which is the conclusion of a ten-year collaborative project, will have profound implications for the moose community as the gravitational field

is now known to be of the right strength to support moose in orbit.

According to John Johnson, head of the NASA Moon Sizing Experiment the first delivery of moose into low moon orbit could be achieved as early as the third quarter of next year. The technology to nurture moose in space is available now", he said, "all that is needed is political will".

Granny wins World Wrestling Championship

By ROY MCROYSTON

Records were smashed in Nicaragua's World Wrestling Championship last night as 78-year-old Maud Johnson, grandmother of five, became the first woman for fifty-six years, and the oldest competitor ever, to claim the gold medal. She walked away with her million dollar share of the prize money, runner up Tommy Thompson from Nigeria taking half a million, and third place New Zealander John Smith receiving a warm handshake from the umpire.

Having started the tournament a rank outsider she began to impress in her second match when she took US number three Ron Rorson by surprise and subdued him in twenty seconds with her unique move that has been dubbed "Maud's Death Grip". The injection of a new wrestling style into the tournament was welcomed by spectators and Johnson's pre- and post-match breakdances have proved entertaining to fans. However, she was still not expected to win in round three last Wednesday, facing off against title-holder Paulo "Spino-Snapper" Lutti, of Vatican City. Underdog Johnson was soon showing her worth with stamina and agility easily matching last year's winner. Lutti's experience paid off initially as he took the first two rounds, but as Johnson became more confident her superior strength came to the fore and she clawed back two rounds to take the contest into a decider. By this time Lutti's body language indicated that he already felt overawed by the

APPENDIX E CONTROL ARTICLE

The Daily

10 OCT 2013

Imagine getting cash out of an ATM without using a debit card.

By AUTHOR

Just like using a "remote control for the ATM," you will soon be able to log onto a mobile app, indicate the amount of money you want and receive it in seconds from an ATM. No debit card necessary – all you need is your phone, financial services giant FIS announced at the Money2020 conference in Las Vegas this week.

Three banks – Wintrust in Illinois, BMO Harris in Chicago and Los Angeles-based City National – have been piloting the service in recent months and plan to launch it across most of their ATMs by the end of 2014.

Here's how it works Using an app on your phone, you can place an order for cash as far as 24 hours in advance or up to seconds before the transaction – like while you're waiting in line to use an ATM.

When you arrive at the ATM to pick up the cash, the app needs to be open on your phone. You then scan a code on the ATM screen to prove that you're actually there and the machine dispenses the cash.

FIS said it has been receiving strong interest from a number of large banks, in addition to other smaller institutions.

This is just one of the latest attempts by banks to revolutionize the ATM experience. Over the past year, Bank of America, Chase and other big banks have been rolling out so-called virtual tellers, ATMs that provide nearly all the same services as a human teller would – including exact change, video conferencing and loan and credit card payment capabilities.

Monahan, of Javelin Strategy &

Research, says cardless ATM transactions using FIS technology generally take less than nine seconds compared to 30 or 40 seconds for a traditional ATM withdrawal.

She also believes the technology is more secure than using a debit card. Using a phone prevents skimming, where fraudsters set up cameras on ATMs to capture your card number and PIN. And even if someone finds or steals your phone, they would need to know your passcode to log in, as well as the information for your bank account and your PIN number – making it far more difficult to steal your identity.

One of the issues this technology faces, however, is connectivity, she said. If there's no cell phone service, a user may not be able to withdraw the money they have pre-ordered. If this happens regularly, it could deter customers from using the service. To address the issue, FIS said it is working on an "offline mode" that would allow people to use their phone to make cash withdrawals no matter how bad their cell phone connection.

Looking forward, the company plans to expand far beyond ATMs. Think gas stations where you can pay by scanning a code at the pump with your phone. Some restaurants are even piloting a service where they put a code on diners' bills that customers can scan in order to pay by phone and leave a tip.

"The phone is becoming a security blanket," said Monahan. "The more you can do with it, the better."

International Moose Count Underway

By BOB O'BOBSTON

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start today with hopes for an increase in the worldwide moose population compared to last year's disappointing figures. Among the traditional early reporters were Egypt, returning figures of six moose, a twenty percent increase on 2011's figures of five, and Uruguay whose moose population remains stable at eleven.

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APPENDIX F
FEAR OF INFERTILITY SCALE

Please rate your level of agreement with or complete the following statements:

FOI 1. *The thought of infertility scares me*

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

FOI 2. *When I think about infertility, I feel nervous*

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

FOI 3. *When I think about infertility, I get upset*

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

FOI 4. *When I think about infertility, I get depressed*

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

FOI 5. *When I think about infertility, I get jittery*

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

FOI 6. *When I think about infertility, my heart beats faster*

Strongly
Disagree

☐

Disagree

☐

Neither agree nor
disagree

☐

Agree

☐

Strongly Agree

☐

FOI 7. *When I think about infertility, I feel uneasy*

Strongly
Disagree

☐

Disagree

☐

Neither agree nor
disagree

☐

Agree

☐

Strongly Agree

☐

FOI 8. *When I think about infertility, I feel anxious*

Strongly
Disagree

☐

Disagree

☐

Neither agree nor
disagree

☐

Agree

☐

Strongly Agree

☐

APPENDIX G PERCEIVED SEVERITY OF INFERTILITY SCALE

Please rate you level of agreement with or complete the following statements:

PSIS 1. *Infertility is a serious condition*

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PSIS 2. *Infertility has major consequences on the lives of those who experience it*

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PSIS-R 3. *Infertility does not have much effect on the lives of those who experience it*

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PSIS 4. *Infertility strongly affects the way others see those who experience it*

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PSIS 5. *Infertility has serious financial consequences*

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PSIS 6. *Infertility causes difficulties for those who are close to those who experience infertility*

Strongly
Disagree

☐

Disagree

☐

Neither agree nor
disagree

☐

Agree

☐

Strongly Agree

☐

APPENDIX H PERCEIVED VULNERABILITY TO INFERTILITY SCALE

PVIS 1. *What is your gut feeling about how likely you are to be infertile?*

Extremely Unlikely	Very Unlikely	Somewhat likely	Very likely	Extremely Likely
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PVIS 2. *I worry about being infertile*

None of the time	Rarely	Some of the time	A moderate amount of time	A lot of the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PVIS 3. *Picturing myself being infertile is something I find:*

Very hard to do	Hard to do	Neither hard nor easy to do	Easy to do	Very easy to do
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PVIS-R 4. *I am sure I will be able to have biological children*

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PVIS 5. *I feel vulnerable to infertility*

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PVIS 6. *There is a chance, no matter how small, I could be infertile*

Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PVIS 7. *I think my chances of being infertile are:*

Zero	Small	Moderate	Large	Very Large
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PVIS 8. *Infertility is something I have...*

Never thought about	Rarely thought about	Thought about some of the time	Thought about often	Thought about all the time
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX I
WORRY ABOUT INFERTILITY SCALE

Please rate your level of agreement with or complete the following statements:

WAIS1. *When you think about your possible infertility risk, how worried do you feel?*

Not worried at all	Slightly worried	Moderately worried	Fairly worried	Very worried
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

WAIS 2. *When you think about your possible infertility risk, how concerned are you?*

Not concerned at all	Slightly concerned	Moderately concerned	Fairly concerned	Very concerned
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

WAIS 3. *How anxious are you about your being infertile?*

Not anxious at all	Slightly anxious	Moderately anxious	Fairly anxious	Very anxious
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

WAIS 4. *Does your chance of being infertile cause you distress?*

Not at all	Slightly, yes	Yes, Moderately	Yes, rather	Yes, very
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

WAIS-R 5. *When you think about your possible infertility risk, how untroubled do you feel?*

Troubled	Slightly untroubled	Moderately untroubled	Rather untroubled	Very untroubled
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

WAIS 6. *How upset do you feel about the possibility of being infertile?*

Not upset at all

☐

Slightly upset

☐

Moderately upset

☐

Rather upset

☐

Very upset

☐

WAIS 7. *Thinking about your chance of infertility, how nervous do you feel?*

Not nervous at
all

☐

Slightly nervous

☐

Moderately
nervous

☐

Rather nervous

☐

Very nervous

☐

APPENDIX J
PREVENTION EFFICACY SCALE

Please rate your level of agreement with or complete the following statements:

PE1. *How capable do you feel of preventing yourself from being infertile?*

Extremely unlikely	Very unlikely	Somewhat likely	Very likely	Extremely likely
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PE 2. *How likely do you feel to be able to prevent yourself from being infertile?*

Extremely unlikely	Very unlikely	Somewhat likely	Very likely	Extremely likely
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX K
COPING EFFICACY SCALE

CE 1. *How likely do you feel it is that you could effectively cope with being diagnosed infertile?*

Extremely
unlikely

☐

Very unlikely

☐

Somewhat likely

☐

Very likely

☐

Extremely likely

☐

CE 2. *How capable do you feel you are to manage infertility?*

Extremely
capable

☐

Very capable

☐

Somewhat
capable

☐

Very capable

☐

Extremely
capable

☐

APPENDIX L
KNOWLEDGE ABOUT INFERTILITY QUIZ

Please answer the following multiple choice questions

KOI 1. *How common is unresolved infertility?*

- a) 3-7 % of couples experience unresolved infertility
- b) 15-20% of couples experience unresolved infertility
- c) 25-32% of couples experience unresolved infertility
- d) 35-45% of couples experience unresolved infertility

KOI 2. *What proportion of couples experience involuntary childlessness for at least one year?*

- a) 1-11%
- b) 12-28%
- c) 29-35%
- d) 35-50%

KOI 3. *What proportion of diagnosed fertility issues are due to the male-factor (infertility of the male partner) and the female-factor (infertility of the female partner) in any given couple?*

- a) 50% Male-factor/50% Female-factor
- b) 75% of fertility issues are female factor, 25% are either male-factor or unexplained
- c) 75% of fertility issues are male-factor, 25% are either female-factor or unexplained
- d) It cannot be determined

KOI 4. *Which of the following increases a man's risk of infertility?*

- a) Repeated Cold Showers
- b) Too much Vitamin C
- c) Too much Tylenol
- d) Mumps

KOI 5. *Which of the following increases a woman's chance of infertility?*

- a) Agricultural work
- b) Drinking Coffee at a younger age
- c) Stress
- d) Not doing Cardiovascular Exercise at least 3 times per week

KOI 6. *What is the difference between Primary and Secondary Infertility?*

- a) Primary infertility is the inability to ever conceive, while secondary infertility is being unable to conceive when you've previously conceived.
- b) Primary infertility refers to the inability of a couple to conceive in the first year of attempting, secondary infertility refers to the inability of a couple to conceive in the second year of attempting.
- c) Primary infertility refers to the inability of a woman to conceive with her first husband, while secondary infertility refers to the inability of that woman to conceive with subsequent husbands.
- d) Primary infertility is the inability to conceive, while secondary infertility is the inability to carry a child to term.

KOI 7. *What is the difference between prevalence and incidence of infertility?*

- a) Prevalence is the number of people who are infertile in a given population at a specific point or for a specific period in time while incidence pertains to the number of people who are newly diagnosed with infertility during a given interval of time.
- b) Incidence is the number of people who are infertile in a given population at a specific point or for a specific period in time while prevalence pertains to the number of people who are newly diagnosed with infertility during a given interval of time.
- c) Prevalence is the number of people who are infertile in a given population at a specific point in time or for a specific period of time while incidence pertains specifically to lifetime prevalence.
- d) Prevalence is the number of people who are newly diagnosed with infertility during a given interval of time while incidence pertains specifically to lifetime prevalence.

KOI 8. *What is the most common treatment for female-factor infertility?*

- a) Surgery
- b) In Vitro Fertilization (IVF)
- c) Assisted Reproductive Technology (ART)
- d) Ovulation-regulating or inducing medication

KOI 9. *When is a women said to be at advanced maternal age?*

- a) 30
- b) 32
- c) 35
- d) 40

KOI 10. *What is generally considered to be advanced paternal age?* (*deleted from final scale score due to ambiguous response options)

- a) 30
- b) 32
- c) 35
- d) 40

KOI 11. *Of women trying to get pregnant, at age 35, how many women will have a conception ending in a live birth at the end of a 1 and 4 years?*

- a) 64% will have conception ending in a live birth within 1 year, and 84% will within 4 years
- b) 50% will have conception ending in a live birth within 1 year, and 62% will within 4 years
- c) 75% will have conception ending in a live birth within 1 year, and 90% will within 4 years
- d) 85% will have conception ending in a live birth within 1 year, and 95% will within 4 years

KOI 12. *For a pregnant women age 35, the chance of having a baby with Down Syndrome is*

- a) 1 in 100
- b) 1 in 400
- c) 1 in 1000
- d) 1 in 2000

APPENDIX M
DEMOGRAPHIC INFORMATION

(Appeared before measures)

All the information you provide is completely confidential and anonymous. There is no right or wrong answer. Please take your time and respond as honestly and thoughtfully as possible.

1. Do you have children?

Yes ☐ No ☐

2. If yes, how many children do you have?

1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 or more ☐

3. If no, are you planning on having children?

Yes ☐ No ☐ Unsure ☐

4. If you are planning on having children, what age do you plan to have your first child?

(#) _____

5. What age are you planning to have your last child?

(#) _____

(Appeared after measures)

1. Have you or a partner ever attempted to conceive for over a year and not conceived?

Yes ☐ No ☐

2. That you know of, has anyone close to you (a friend or family member) ever attempted to conceive for an extended period of time without achieving pregnancy?

Yes ☐ No ☐

3. Age: _____

4. Sex: M ☐ F ☐ Prefer not to disclose ☐

5. Race/Ethnicity/cultural heritage: _____

6. Sexual orientation _____

